OCTOBER 2015

Bloomberg Markets

IT'S ALL ABOUT THE BLOCKCHAIN

BLYTHE MASTERS IS BETTING THE DIGITAL LEDGER BEHIND BITCOIN WILL REVOLUTIONIZE THE WAY WE TRADE BONDS, LOANS, DERIVATIVES, AND MUCH ELSE.

+

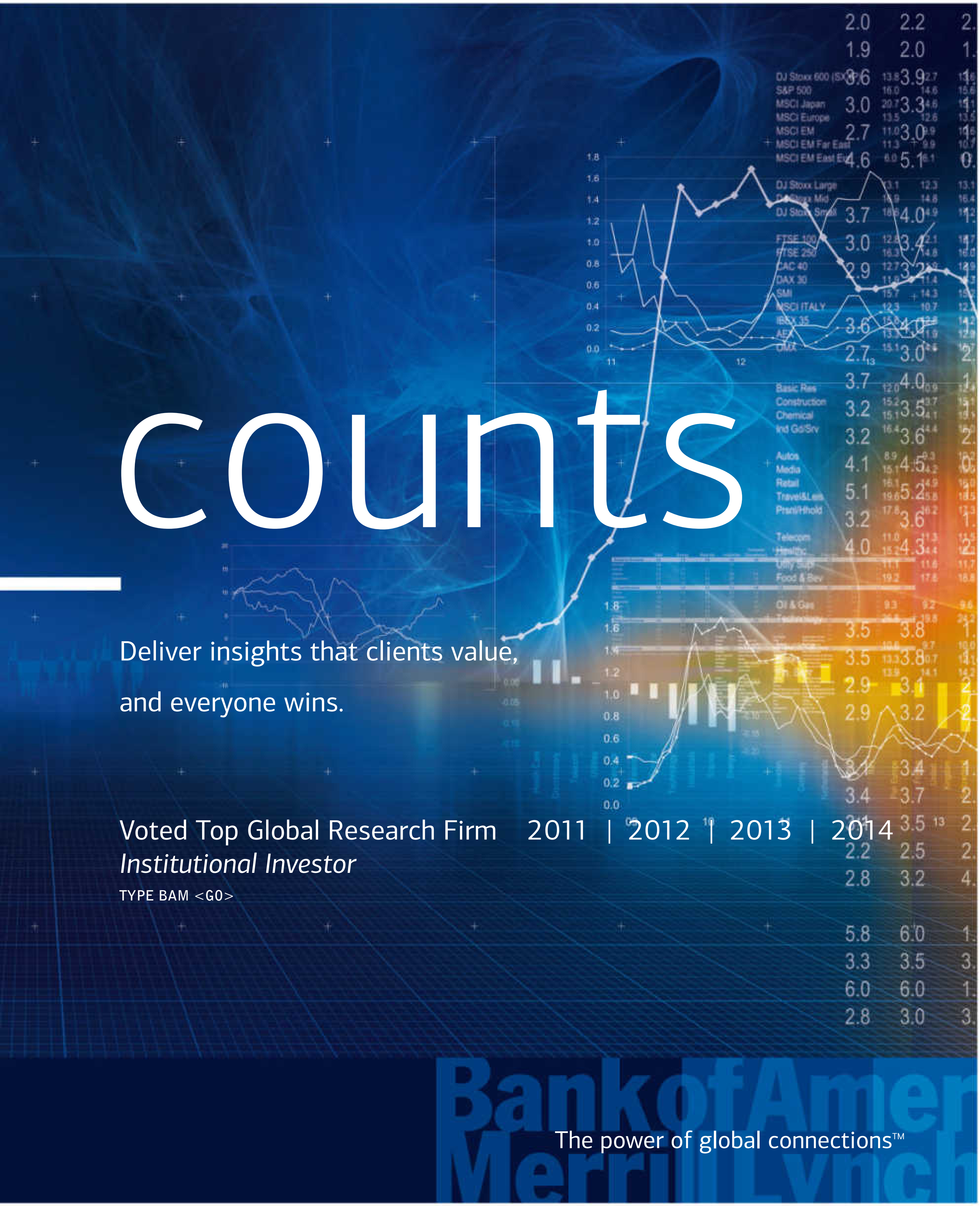
THE INNOVATORS

BRAD KATSUYAMA'S NEXT CHAPTER

A BANK FOR PEOPLE WHO HATE BANKS

WHO WANTS TO START AN ETF?

A HUNDRED APPS BLOOM IN CHINA


counts
Deliver insights that clients value,
and everyone wins.
Voted Top Global Research Firm 2011 | 2012 | 2013 | 2014
Institutional Investor
TYPE BAM <GO>
The power of global connections™
Bank of America Merrill Lynch


©2015 Cartier
Cartier
ROTONDE DE CARTIER
MYSTERIOUS DOUBLE TOURBILLON 9454 MC
THE ROTONDE DE CARTIER MYSTERIOUS DOUBLE TOURBILLON 9454 MC WATCH, CERTIFIED "POINÇON DE GENÈVE", IS A FORMIDABLE FEAT OF FINE WATCHMAKING DESIGNED USING THE PRINCIPLE OF MYSTERY CLOCKS, EMBLEMATIC MAISON CREATIONS THAT DATE BACK OVER A CENTURY. ESTABLISHED IN 1847, CARTIER CREATES EXCEPTIONAL WATCHES THAT COMBINE DARING DESIGN AND WATCHMAKING SAVOIR-FAIRE.
GENEVE
POINÇON DE GENÈVE
WWW.CARTIER.US - 1-800-CARTIER


CARTIER
SWISS MADE

INSTITUTIONAL INVESTORS FLOCK TO SMART BETA

With more than $400 billion in assets under management (and growing), smart beta ETFs have proven to be a smart choice for strategic money managers

Exchange-traded funds, or ETFs, are in the news again, as investors seek more actively managed options than standard passive funds that mirror traditional indexes. But as today's smartest money managers can attest, the key ingredient in the secret sauce of smart, innovative portfolios is "smart beta."

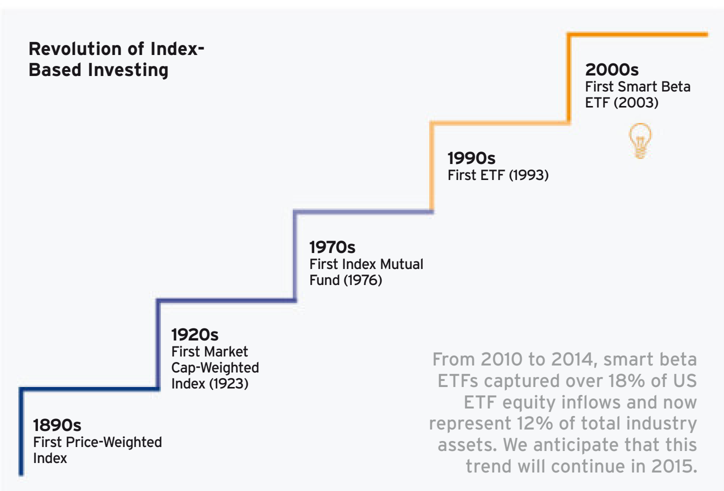
Alternatively referred to as "strategic beta" and "intelligent beta," smart beta ETF methodologies reside at the intersection between passive and active fund management—and for good reason. Passive investing in market-cap-weighted indexes has a limitation: As stocks gain in popularity, their prices rise and reflect investor overconfidence, leading to periods of overvaluation. The corrections that follow these periods are often sharp and painful to many investors. Meanwhile, actively managed funds have their own drawbacks, including higher management fees.

Smart beta ETFs, on the other hand, rely on rules-based quantitative analysis to select stocks for their capital appreciation potential at low cost[1]. At the same time, they actively apply alternative weighting—based on factors such as sales, cash flow, book value or dividends—to a wide range of indexes, and employ strategies that seek a better risk-and-return trade-off than conventional indexes. For that reason, it's no surprise that some money managers began gravitating to smart beta in a serious way during and after the financial downturn in 2008.

In the midst of a highly uncertain economic climate and volatile markets, many experts moved away from traditional market-cap-weighted indexes, like the S&P 500, in favor of access to custom indexes, alternative weighting strategies and the use of filters to factor elements such as dividends, liquidity, volatility and risk. The goal: to outperform traditional benchmarks while reducing risk and providing access to an array of focused investment opportunities. Additionally, smart beta ETFs are attractive because they cost less than actively managed funds while permitting more transparency[2] and greater portfolio flexibility and diversification[3].

Now, the rest of the institutional investment world appears to be catching on to smart beta ETFs.

Last spring, a study conducted by Market Strategies International for Invesco, a leading independent global investment management firm, found a significant increase in smart beta ETF usage among institutional investors, endowments and pension funds. According to the study, the number of institutional investors in smart beta ETFs increased from 24 percent in 2013 to 36 percent in 2014. In another finding, over the next three years nearly two-thirds of these decision-makers say they plan on increasing their use of smart beta ETFs over all other investment devices, including market-cap ETFs.



"Clearly, ETFs as an industry have scaled up—in 2014 investors added over $240 billion to U.S.-listed ETFs—with record inflows in each of the last three calendar years," says Dan Draper, Managing Director at Invesco PowerShares, a smart beta ETF provider. "What's important about the interest level is that it shows that you need to have size, a historical track record and liquidity to really attract larger pockets of money. I think this is why institutions are finding that they can use the products effectively."

In 2003, PowerShares, which helped pioneer the smart beta ETF movement, began offering clients smart beta products that ranged beyond traditional weighted markets. (Invesco purchased PowerShares in 2006; the company invests in more than 140 domestic and international exchange-traded funds.)

Today, Invesco PowerShares offers 85 strategies representing nearly 25 percent of smart beta ETFs in the marketplace.

The growth of ETFs is being driven in part by a registered investment adviser community that has moved away from commission-based models to fee-based models, where ETFs are low-cost. That's helped grow the industry to achieve the size, scale and track records of companies like Invesco PowerShares, which are increasingly drawing big-money institutional investors that no longer need to customize solutions through separately managed accounts. Currently there are over 400 smart beta ETFs in the market with more than $400 billion in assets under management, which represent about 20 percent of ETF market share.

"Today, we have actual historical track records through really severe market downturns, like 2008," notes Draper. "Institutional investors are saying, 'We heard the marketing buzz 10 years ago, but now we can see the performance history of the core products, and believe we can use them on a large scale.'"

Meanwhile, the current economic climate isn't exactly hurting alternative investment protections and opportunities. An unprecedented monetary policy driving developed-market interest rates to zero—and at times negative levels—has led to the narrow dispersion of returns in risky assets, as well as limited rewards for traditional security selections. At the same time, the likelihood of increased volatility and a rate increase from the Fed is repositioning some institutional thinking toward more liquid[4] and transparent ETFs.

"If you own the market—say, the S&P 500—then you're effectively going to perform average within that market, minus a management fee," Draper says. "But if you're a fiduciary, and you have some preferred asset-allocation or security-selection capability, then it's to your advantage to exploit it in order to do a little bit better than the market."

High-profile institutions have taken notice. In 2014, CalPERS (the California Public Employees' Retirement System)—the largest U.S. public pension fund, with more than $300 billion in assets—allocated $28 billion in what it calls "alternative beta" to its equity portfolio. The same year, Towers Watson, the global professional services company, reported that it would be allocating over $8 billion to smart beta strategies—amping up its exposure to some $40 billion, or double its 2012 figure. Everywhere you turn, it seems institutional investors are betting on smart beta, and those that do could be rewarded in a big way. — *Tom Connor*

YOU NEED TO HAVE SIZE, HISTORICAL TRACK RECORD AND LIQUIDITY TO REALLY ATTRACT LARGER POCKETS OF MONEY.

October

volume 24 / number 09

‘You have these debt crises going on; these things couldn’t happen if everyone used bitcoin.’ *Adrian Forbes, bitcoin entrepreneur, Isle of Man* *page 60*

FEATURES

60

The INNOVATORS

PHOTOGRAPH BY **WILL SANDERS**

October

FEATURES (CONTINUED)

COMMENTARY

AGENDA

STRATEGIES

GET OUR iPAD APP.

Download at **MKTS <Go>** or **bit.ly/bbmarkets**.

ON THE COVER
PHOTOGRAPH BY **GUZMAN**

Chanin soon discovered the cottage industry that existed for building ETFs. All he needed was an idea, seed capital, and some money for expenses. *page 86*

86

PHOTOGRAPH BY **SASHA MASLOV**

Editor's View

New Kids on the Blockchain

> 'You should be taking this technology as seriously as you should have been taking the development of the Internet in the early 1990s,' says Blythe Masters.

BLYTHE MASTERS, the financial innovator who helped bring the world the credit-default swap, didn't invent the blockchain. But Masters, a former JPMorgan Chase executive who's now CEO of Digital Asset Holdings, is one of many entrepreneurs who see huge opportunities in the digital ledger that underpins bitcoins. The virtual currency itself may not yet have lived up to the hype of its proponents, but the blockchain, Masters tells Edward Robinson and Matthew Leising, has the potential to revolutionize the way we trade bonds, loans, commodities, real estate—and much else (**"SELLING THE BLOCKCHAIN TO WALL STREET,"** page 46). "You should be taking this technology as seriously as you should have been taking the development of the Internet in the early 1990s," Masters says.

Another entrepreneur stirring things up is Brad Katsuyama, the unlikely hero of Michael Lewis's *Flash Boys*. Jeremy Kahn reports on Katsuyama's plans to turn his dark pool, IEX, into a public exchange (**"BRAD KATSUYAMA'S NEXT CHAPTER,"** page 32). Kahn also journeyed to the decidedly out-of-the-ordinary Isle of Man, which is setting itself up as a haven for cryptocurrency converts (**"GREETINGS FROM BITCOIN ISLAND,"** page 60).

Elsewhere, Anthony Effinger profiles the people who create exchange-traded funds and the indexes they're based on (**"WHO WANTS TO START AN ETF?"** page 86); Stephanie Baker tracks a U.K. firm designing a virtual bank (**"BUILDING A BANK FOR PEOPLE WHO HATE BANKS,"** page 68); and Shai Oster (**"LET A HUNDRED APPS BLOSSOM,"** page 76) reports on China, where mobile-minded upstarts are setting the pace for a world aflutter with financial innovation.

Ron Henkoff

EXECUTIVE EDITOR

To write a letter to the editor, e-mail **bloombergmag@bloomberg.net** or type **MAG <Go>** on the Bloomberg Professional service.
For subscription questions, e-mail **bloombergmarkets@cdsfulfillment.com**.
Visit us at **bloombergmarkets.com** and follow us on Twitter at **@markets**.

Letters

Mary Nichols and the Auto Industry

SEPTEMBER 2015

This is an outstanding piece that includes great stories I've never heard. Some automakers absolutely hate it when requirements are loosened. They're the ones who have already moved quickly to address the current rules and then have to change again.

MARK ABRAMOWITZ
President, Community Environmental Services
Yorba Linda, California

Rivalry Issue

JULY/AUGUST 2015

I always find *Bloomberg Markets* magazine interesting and insightful, but this issue was especially entertaining and educational. The best part was reading about Argentina's rebellious streak since I share a birthday with the country and enjoy being a rebel myself.

JAIME JACOB
Denver

TWEETS

LinkedIn CEO Jeff Weiner had this to say about "Goldman in Ventureland" (September 2015):

And "The Scandal That Ate Malaysia" (September 2015) was shared by Vikram Nehru, a senior associate at the Carnegie Endowment for International Peace:

UPDATE

The Scandal That's Still Eating Malaysia

Since we published "The Scandal That Ate Malaysia," the country's anti-corruption body has concluded that almost $700 million in Prime Minister Najib Razak's personal accounts came from unidentified donors in the Middle East, and not from 1Malaysia Development Bhd., a state-owned investment company closely tied to him. A week earlier, Najib had replaced his deputy and the attorney general probing allegations that cash ended up in Najib's accounts after moving through agencies and companies linked to debt-ridden 1MDB. Investigations into the company are continuing.

Foreign funds have dumped $3 billion of the nation's shares this year, and global investors cut holdings of government and corporate bonds to the lowest level in three years in July. Foreign-exchange reserves that month dropped below $100 billion for the first time since 2010, and in mid-August, the benchmark FTSE Bursa Malaysia KLCI Index fell to its lowest level since March 2013. **YOOLIM LEE**

INFORMATION FOR READERS

LETTERS TO THE EDITOR Send an e-mail to bloombergmag@bloomberg.net or type **MAG <Go>** on the Bloomberg Professional service. We reserve the right to edit all letters for space and clarity.

REPRINTS Contact The YGS Group at 717-505-9701 x104 or BloombergReprints@theYGSgroup.com.

SUBSCRIPTIONS For address changes and requests for copies, call 212-617-7880, send an e-mail to bloombergmarkets@cdsfulfillment.com, or fax 917-369-8400. To subscribe, call 1-888-BLOOMBERG. For assistance in running functions on the Bloomberg Professional service, press <Help> twice.

AGENDA

Why Drugmakers Are Buying Each Other

Global mergers and acquisitions are on a record pace this year, with the pharmaceutical industry leading the way.

WHEN TEVA PHARMACEUTICAL Industries agreed to buy Allergan's generics business for $40.5 billion on July 27, the value of announced deals by drugmakers this year topped the tally for all of 2014, which was a record. And the view among bankers and analysts was that more were coming—perhaps, even, a $100 billion–plus transaction.

Pfizer, the 166-year-old U.S. giant, might be tempted to bid for the rest of Allergan, which will still have best-selling branded treatments such as Botox and a pipeline of new products after the Teva transaction. "A 30 percent slimmer, all-brand, unlevered Allergan would be the perfect size for a Pfizer purchase," Sanford C. Bernstein analyst Ronny Gal says. Allergan was valued at about $125 billion as of early August.

Allergan, alternatively, might be the hunter rather than the hunted, according to Gal. Amgen, based in Thousand Oaks, California, and AbbVie in North Chicago, Illinois, would be likely targets. Each company was valued at more than $120 billion recently.

And Teva, in deciding to buy Allergan's generics, ended its pursuit of Mylan, a global generic drugmaker that's now free to do a deal of its own. Mylan in April made a $35 billion unsolicited bid for Dublin-based Perrigo, which rejected the price as too low. Mylan CEO Heather Bresch said on a conference call on Aug. 6 that she wants

the Perrigo deal, but she also said she's looking at other targets that could be fallbacks. The only option she didn't discuss was doing nothing. Such is the tone in the pharmaceutical industry today.

What's driving the M&A boom? Patent expirations on blockbuster medicines are forcing companies such as Pfizer to look for growth through acquisitions. And tax advantages figure in as well. A deal for Allergan, headquartered in Dublin, would allow Pfizer to move its legal domicile to Ireland, where the corporate tax rate is lower.

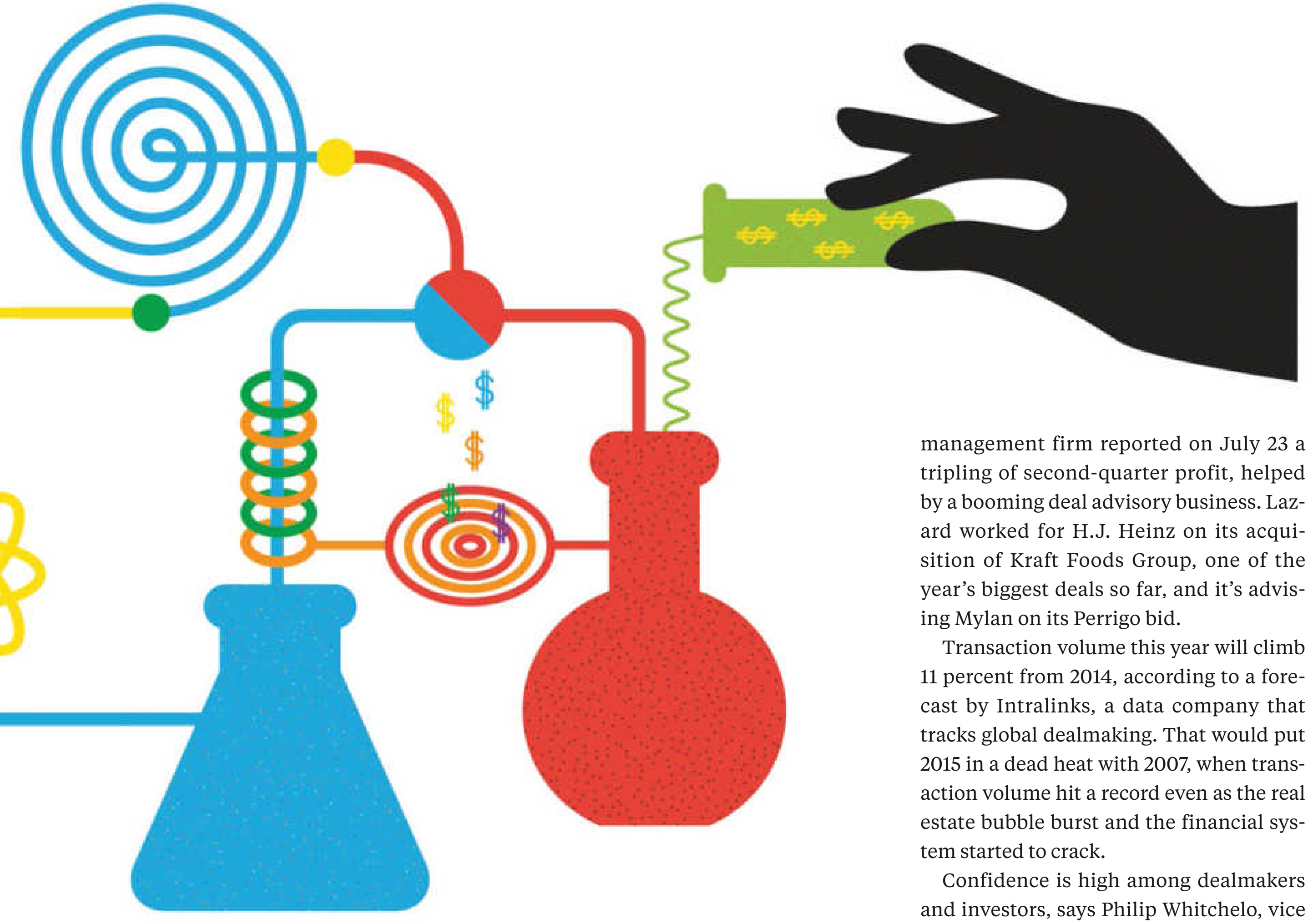
Just a week after the Teva-Allergan announcement, Shire, another drugmaker with a Dublin address and the related tax advantages, made an unsolicited, $30 billion, all-stock offer for Baxalta, a biopharmaceutical company just spun off from Baxter International of Deerfield, Illinois.

Shire's bid helped bring the total of year-to-date announced pharmaceutical mergers to about $225 billion as of Aug. 12—and the amount across all industries globally to $2.1 trillion. That's a record-breaking pace if it keeps up.

"Many executives and advisers who might otherwise have been enjoying some well-earned downtime are spending the summer at the deal table," says Pip McCrostie, global vice chair of transaction advisory services at EY, an auditing and professional services firm. "M&A has become the first choice for future growth," says McCrostie, who's based in London.

There were 31 deals worth more than $10 billion apiece announced in the first six months of this year, the most megadeals ever in a first half, according to an EY report. And big transactions kept coming, including Berkshire Hathaway's agreement on Aug. 10 to buy Precision Castparts for $37 billion.

"The market is characterized by some of the most important companies doing important and very strategic deals," Ken Jacobs, CEO of Lazard, says in an interview. His investment banking and money



management firm reported on July 23 a tripling of second-quarter profit, helped by a booming deal advisory business. Lazard worked for H.J. Heinz on its acquisition of Kraft Foods Group, one of the year's biggest deals so far, and it's advising Mylan on its Perrigo bid.

Transaction volume this year will climb 11 percent from 2014, according to a forecast by Intralinks, a data company that tracks global dealmaking. That would put 2015 in a dead heat with 2007, when transaction volume hit a record even as the real estate bubble burst and the financial system started to crack.

Confidence is high among dealmakers and investors, says Philip Whitchelo, vice president of strategy and product marketing at Intralinks. "Expectations for a strong close to 2015 seem reasonable," he says.

Even at Teva, there may be more to come. CEO Erez Vigodman says the Israeli company is on the lookout for additional acquisition targets. In an interview on July 27, after the Allergan announcement, he was asked about the wave of mergers in his industry and had a simple answer: "You cannot sit still." **TARA LACHAPELLE**

ILLUSTRATION BY **ANDRÉ DA LOBA**

SPK-RPE65
A gene therapy for blindness from Spark Therapeutics, not yet approved, could be the first U.S. drug costing **$1 MILLION** per patient, according to forecasts by two analysts.

The Future of Mortality

Historian and best-selling author Yuval Harari sees techies trying to defeat death—and warns their effort could make inequality worse.

DEATH IS THE GREAT EQUALIZER, right? It always has been, but Silicon Valley might be changing that.

More and more tech entrepreneurs and venture capitalists see the effort to extend life as the next big thing. "Death will eventually be reduced from a mystery to a solvable problem," billionaire Peter Thiel, the Facebook director and PayPal mafia member, wrote in the foreword to a book on longevity a few years back. More recently, Bill Maris, who invests hundreds of millions of Google's dollars, told this magazine, "I just hope to live long enough not to die." (See "Google Ventures and the Search for Immortality," April 2015.)

The push to keep mortality at bay could be a defining characteristic of the current era, says Yuval Harari, a lecturer at the Hebrew University of Jerusalem and author of *Sapiens: A Brief History of Humankind*. "Whereas in traditional societies, the idea was that people die because god says so or because the cosmos says so and there is nothing you can do about it, the scientific idea is that you always die because of some technical problem. Like the heart stops pumping blood or something," Harari says. "And every technical problem, at least in theory, has a technical solution."

As a social scientist, Harari tries to describe, rather than judge, this epochal shift in how we view death. Still, he raises a sticky question about life-extending technology: "Whether it's going to be for everybody or only for the very rich." He's not reassuring as he ponders possible answers.

Medical science in the 20th century brought us vaccination campaigns, antibiotics, and hygiene systems that cut child mortality and virtually eliminated some diseases. "The main thing was to heal the sick," Harari says, "and this is essentially an egalitarian project, because you try to give everybody the same normal health." But striving for equality as one of society's highest ideals is an exception across human history; hierarchy and inequality are the norm. (Read Harari's book if you doubt it.)

"What you saw in the 20th century is that there were economic, military, and political reasons for countries, for societies, to invest in the health of all the population," Harari says. Powerful nations needed healthy humans to fill their armies and navies, their factories and fields, he argues. Such needs are vanishing as drones fight wars and robots run factories.

This change colors Harari's view of what will happen with new technologies and medicines that extend and improve lives. Such breakthroughs will be expensive, and there may be fewer incentives to make them cheaper and widely available. "We can't go on assuming that people will still have the military and economic importance they had in the 20th century," Harari concludes. "So we can't just take it for granted that any medical advancement will automatically be given to the masses." **ROBERT S. DIETERICH**

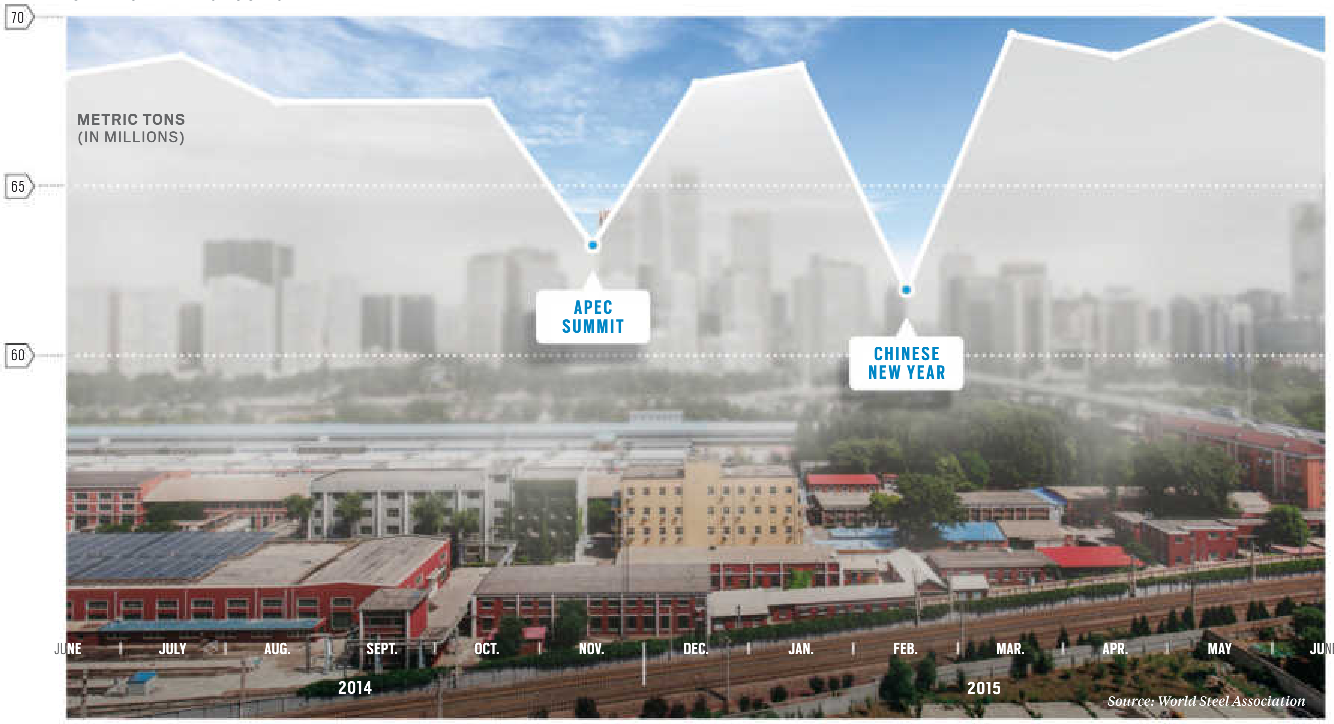
SUNSET BOULEVARD/CORBIS

ONE OF THESE IS WRONG

500 MILLION TONS
Economist Andy Xie's forecast for China's annual steel output a decade from now

1.1 BILLION TONS
Iron ore miner BHP Billiton's prediction

CHINA STEEL PRODUCTION



Source: World Steel Association

Blue Skies, Cloudy Outlook

As China struggles to counter slowing growth, its air pollution problem makes the task harder.

WHEN CHINESE LEADERS welcome global visitors to Beijing, they don't just roll out the red carpet; they sometimes order up blue skies. Cars are kept off the streets, and industrial plants in the region are temporarily shut.

The 2008 Beijing Olympics is the best-known example, but there have been other occasions since, including the Youth Olympics in August 2014 and the Asia-Pacific Economic Cooperation summit in November.

The effect on the air is noticeable enough that some Beijing residents talk about the sky being "APEC blue." The effect on the economy is enough that it shows up in government data. Gross domestic product dropped from a 9 percent annual pace in July 2014 to just 7 percent in August and dipped again in November. Statistics on steel output show the pattern, too.

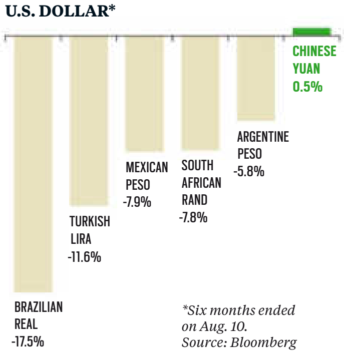
Goldman Sachs, in a report, warned that such events keep coming and cited the IAAF World Championships in late August of this year and the dedication of a World War II memorial in September as events that could have an economic impact. While officials scramble to spur growth, with measures such as the People's Bank of China weakening the currency, it remains to be seen how they will weigh cleaner air for Beijing's guests against growth the next time around.

ENDA CURRAN

YUAN TRAP

Before China moved to devalue the yuan in August, it had become an outlier among troubled emerging-markets economies. As other currencies plunged, the yuan gained half a percent versus the dollar over six months. The resulting disadvantage to the economy was probably a better argument than anything the International Monetary Fund might say in favor of allowing market forces a greater role in setting the yuan's value.

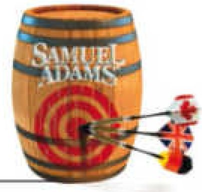
RETURN VERSUS U.S. DOLLAR*



Six months ended on Aug. 10. Source: Bloomberg

GETTY IMAGES/MOMENT RF

'Because of our broken corporate tax system, I can honestly predict that I will likely be the last American owner of Boston Beer Company.'—founder Jim Koch testifying before a Senate subcommittee about the advantage of selling to a foreign buyer



Luxury Rum on the Rise

Sip these limited-edition, aged versions of the cocktail spirit on their own, without a beach umbrella in sight.

WHEN I FIRST tasted Bacardi's $250 Facundo Paraíso XA rum in the New York Palace hotel's library, it smelled like spice cake and left a deep, smoky tingle of brown sugar and butterscotch. I was impressed. It was as seductive as a single-malt whisky yet as smooth and sweet as a small-batch bourbon.

Rum's image is still anchored in beach bar cocktails and spiced versions with a pirate or palm trees on the label, but makers of the spirit are increasingly pushing into the luxury business. According to the Distilled Spirits Council of the United States, sales of super-premium rum (more than $45 a bottle) rose 414 percent by volume in the U.S. from 2003 to 2014—10 times the growth rate of ordinary rum.

Following the example of other types of distillers, rum makers are producing limited editions of rare, long-aged blends, such as Paraíso, and small-batch and single-barrel bottlings. Rich, complex, and delicious, all are about as far from cheap mixers as you can get.

Bacardi tapped private family reserves for Paraíso and three other blends that debuted in New York at the end of 2013 and are arriving in Paris and London this fall. The Dominican Republic's Brugal sourced its Papá Andrés Alegría edition for 2015 from the remaining 36 family casks kept under lock and key at the company's warehouse.

Tropical temperatures speed up the aging process, so a 10-year-old rum is more like a 30-year-old Scotch. Older ones are more expensive because of evaporation during aging; 50 gallons are reduced to 5 over 23 years (the age of the oldest rums in Paraíso).

So far, there are only a few vintage-dated rums, mostly from Martinique, but retailers such as K&L Wine Merchants in the San Francisco Bay Area and Samaroli in Rome are hunting down and selecting single barrels to bottle.

For the most expensive examples, bespoke decanters are de rigueur. Angostura's $25,000 Legacy comes in an Asprey-designed art deco crystal decanter with sterling silver topper; only 20 were produced.

Does the specific spot where sugar cane is grown make a difference to a rum's taste? I'm dubious, but the idea taps into the same luxury spirits trend that brought us single-village mezcals. Earlier this year, Rémy Cointreau purchased the historic, 134-hectare (331-acre) Mount Gay plantation in Barbados for its brand of the same name and plans to create—what else?—a *terroir* rum. **ELIN McCOY**

Tasting Notes

Ron Abuelo Centuria ($140)
Launched in 2011 to celebrate the Varela family's 100 years of rum making, it's rich and spicy, with notes of coffee and gingerbread.

El Dorado 21-year-old Demerara ($100)
Made in historic 200-year-old wooden pot stills, this rum smells of mocha and tobacco and has a velvety texture.

Facundo Paraíso XA ($250)
Thick, concentrated, and subtle, this rum is finished in XO cognac barrels. The complex, heady Exquisito ($90) is almost as good.

Brugal Papá Andrés Alegría (2015) ($1,500)
Created by a fifth-generation member of the Brugal family from rums aged in different types of casks, it's light, silky, and subtle, with aromas of dried fruit and caramel.

Origenes Reserva Don Pancho 30-year-old ($250)
Legendary Cuban distiller Francisco "Don Pancho" Fernandez made this sensual-tasting rum in Panama. Only 600 bottles were produced.
E.Mc.

COURTESY OF BACARDI: 5W/731

Spain Gets Back on Track

The economy looked down and out only a few years ago. Today, it's stronger. But there's still plenty of work to be done.

SO ECONOMIC STAGNATION is the new European normal, and the southern periphery is the euro area's Achilles' heel? Spain just posted its strongest quarterly expansion for eight years and predicts 3.3 percent growth for the year as a whole. Maybe there's a lesson here.

There is, but it's a bit more complicated than "austerity works"—the message that Europe's finance ministers and the International Monetary Fund might choose to emphasize. The economy suffered a crippling downturn in the financial crisis. It then hobbled along until the European Central Bank stepped in to prevent speculative runs on Spain's sovereign debt.

Prime Minister Mariano Rajoy of the conservative People's Party bowed to austerity demands, cut public-sector wages and benefits, and increased the country's value-added tax to 21 percent (with exemptions) from 18 percent. He also braved street protests and the rise of an anti-austerity, left-wing opposition party, Podemos, to persist in a deliberate rewiring of the economy, as María Tadeo, Esteban Duarte, and Edward Robinson report in "The Man in the Middle" on page 92.

Companies have been given more flexibility to set wages and working conditions. The government said it would lower the corporate tax rate to 25 percent from 30 percent. The top marginal rate on personal income will fall to 45 percent from 52 percent. The barriers that created Spain's notorious two-tier labor market, with its underclass of workers on temporary contracts, have begun to fall.

Spaniards, like these at Madrid's **Atocha Station**, have some cause for optimism after years of hardship.

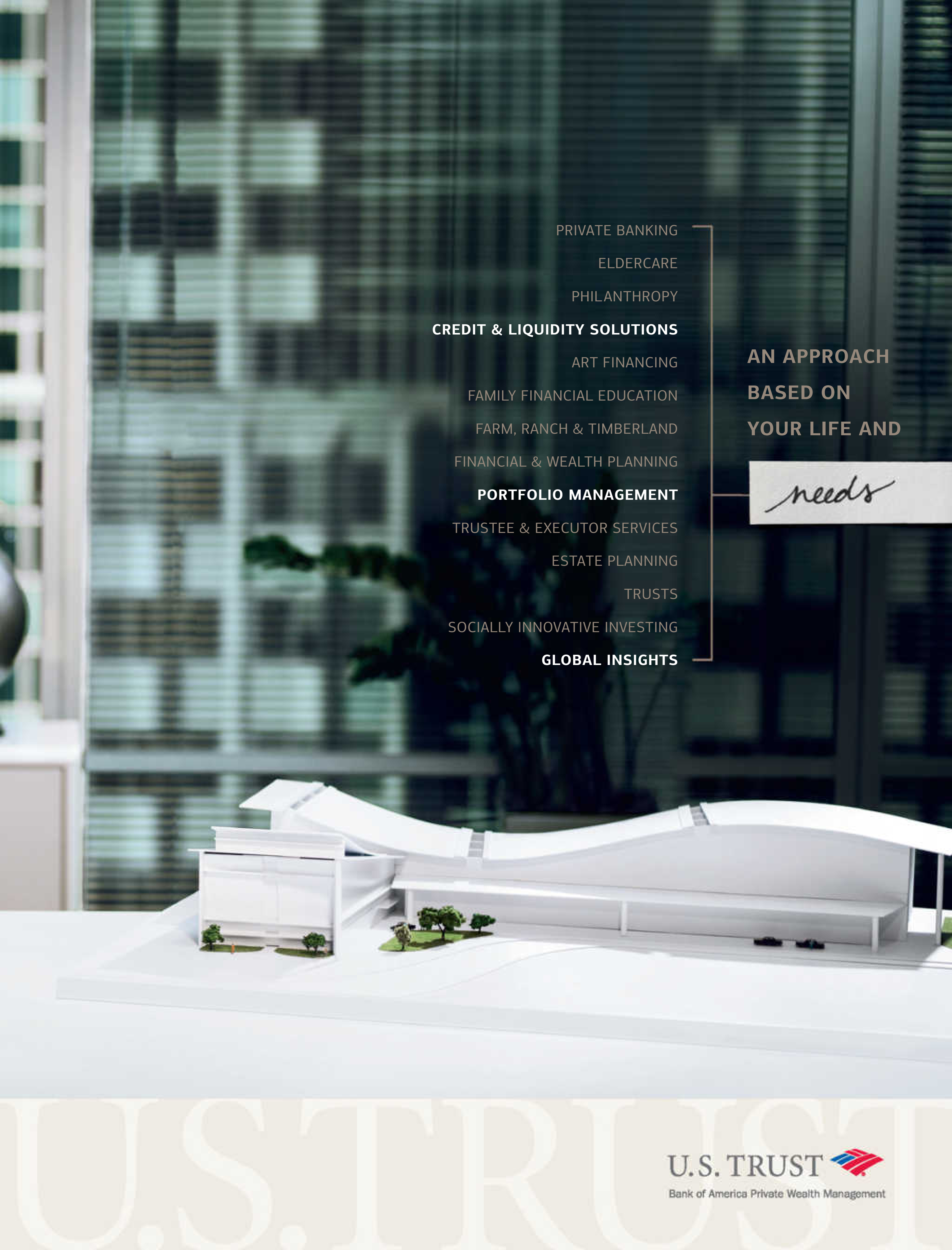
OLI SCARFF/GETTY IMAGES

Whether that will prove enough to win re-election for Rajoy's party in a vote likely to be held by the end of the year is another matter. A raft of corruption scandals has badly damaged the party's appeal, and two upstart political movements—Podemos and the pragmatic Ciudadanos—are between them polling around 31 percent in opinion surveys, making another single-party government unlikely.

Whoever forms the next government should be under no illusion: The job is far from finished. Structural unemployment—what's left when growing demand has done all it can—will remain a massive challenge. The government could do more to help match job seekers, many of them high school dropouts, with work or training. Above all, to avoid repeating the errors of the past, it will need to be careful about maintaining fiscal discipline as recovery boosts revenues and financial pressure subsides.

Nonetheless, today's Spain proves an important point: Contrary to reports, geography and euro membership condemn no country to economic failure.

BY THE EDITORS OF BLOOMBERG VIEW
To read more editorials, type **VIEW <Go>** on the Bloomberg Professional service or go to **BLOOMBERGVIEW.COM**.


PRIVATE BANKING
ELDERCARE
PHILANTHROPY
CREDIT & LIQUIDITY SOLUTIONS
ART FINANCING
FAMILY FINANCIAL EDUCATION
FARM, RANCH & TIMBERLAND
FINANCIAL & WEALTH PLANNING
PORTFOLIO MANAGEMENT
TRUSTEE & EXECUTOR SERVICES
ESTATE PLANNING
TRUSTS
SOCIALLY INNOVATIVE INVESTING
GLOBAL INSIGHTS
AN APPROACH BASED ON YOUR LIFE AND
needs
U.S. TRUST
U.S. TRUST
Bank of America Private Wealth Management

THE INNOVATORS

BRING ME A UNICORN. IN FACT, A BUNCH.

THESE DAYS, being a thoroughbred isn't good enough. Even American Pharoahs barely get a second look.

Everyone in finance wants a unicorn. And by unicorn, they mean a young, private tech company that has a valuation of more than $1 billion before its founders even think about an initial public offering.

They're called unicorns because, until recently, they were imaginary. Then came Uber, Xiaomi, Spotify, Flipkart, Palantir Technologies ... you know the names. *Bloomberg Markets* wrote last month about Goldman Sachs's quest to find and fund them. According to CB Insights, which tracks them, there are 125 unicorns worldwide. A herd, if that's how unicorns roll.

Underrepresented on that list are startups in financial technology. For years, entrepreneurs shunned finance—save for online stock trading—because the thicket of global banking regulations made taking on HSBC and JPMorgan Chase and Deutsche Bank just too tough.

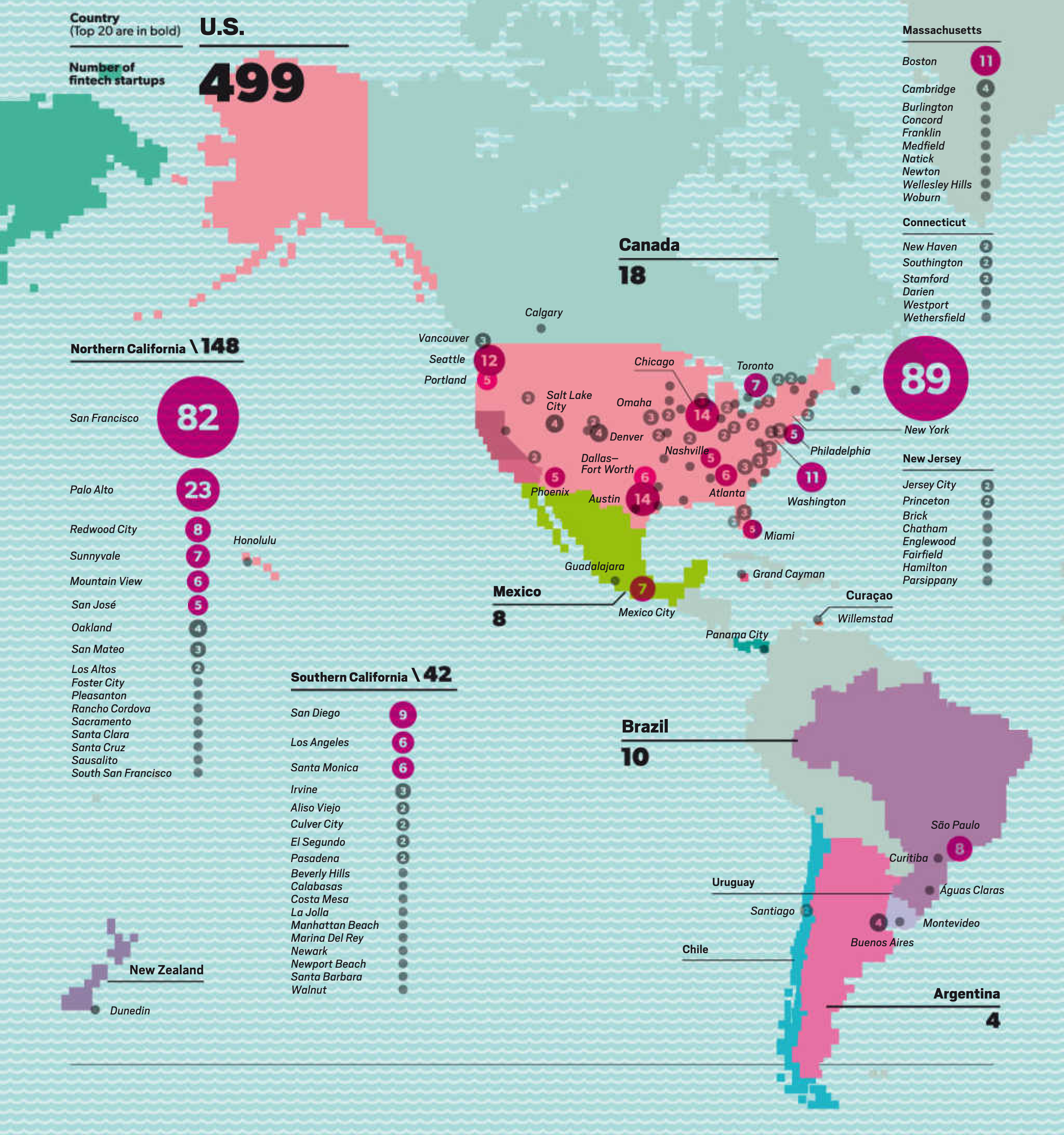
As a result, only 16 of the companies on the CB Insights list are pegged as fintech.

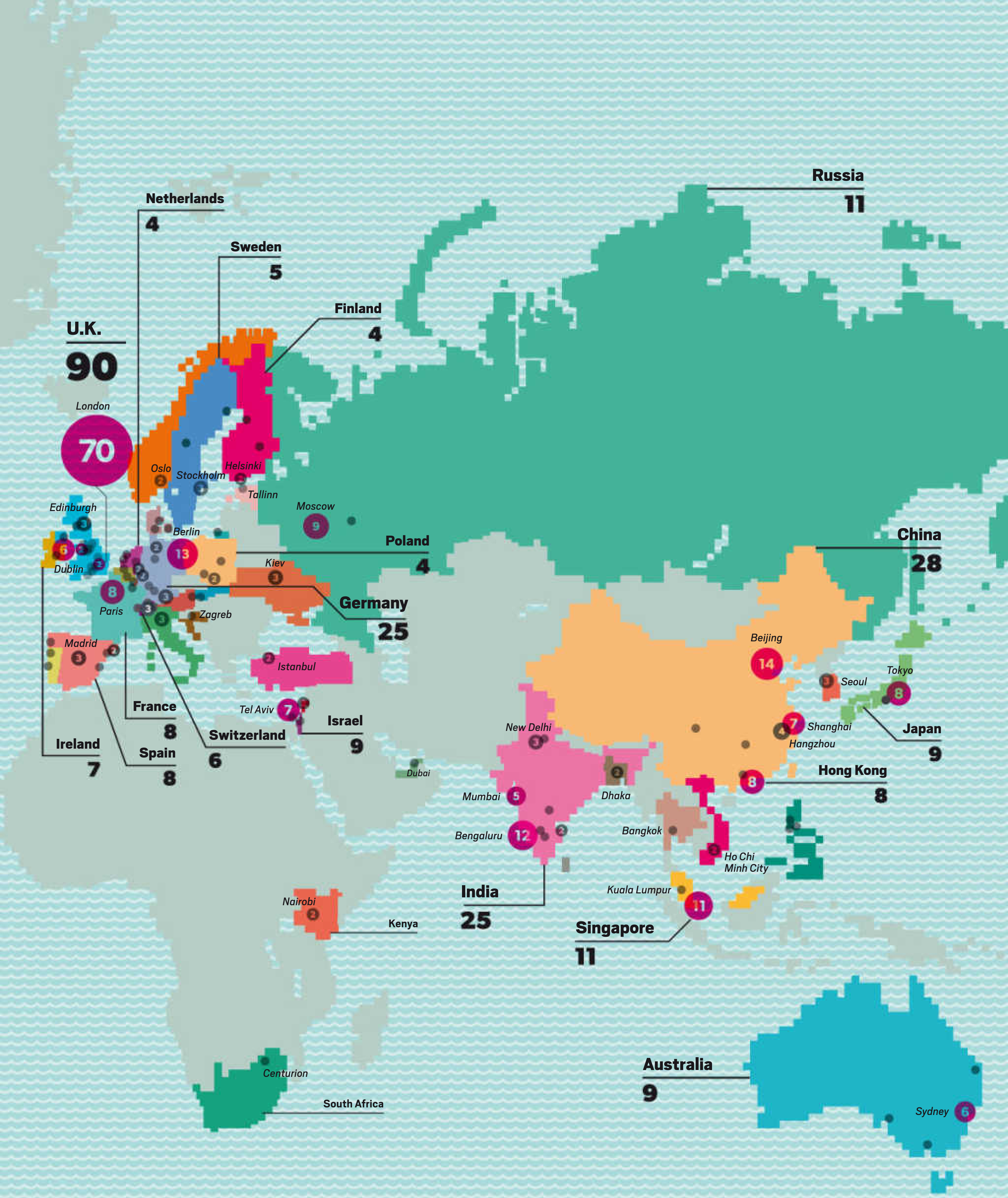
But fintech is likely to produce more billion-dollar babies soon. Today's entrepreneurs are not afraid. They have complete faith in their technology and their read of the marketplace. You'll see that over the next 44 pages, in the stories of bitcoin and blockchain pioneers, mobile-banking renegades, upstart exchange operators, and more.

As our map on the next page shows, fintech upstarts are at work all over the world—855 of them, including 25 in India, 10 in Brazil, and four in Poland. And one in Curaçao. Given the energy that's going into innovation in finance, you wouldn't want to bet against a few of them joining that herd.

LOOK AROUND

In the past 2½ years, research firm PitchBook Data has counted 855 startup companies in the area of financial technology—fintech. They are in the obvious and familiar places, but they're also distributed around the globe. The future is coming from anywhere and everywhere.





PitchBook Data tracked companies founded from Jan. 1, 2013, to June 30, 2015. It defined fintech companies as those providing software and/or hardware to enable automated financial transactions. Figures for some U.S. cities include companies in the surrounding metropolitan areas.

BY JEREMY KAHN

BRAD KATSUYAMA'S NEXT CHAPTER

HIS ONCE TINY DARK POOL GOT A BIG BOOST FROM *FLASH BOYS*. NOW, THIS UNLIKELY CELEBRITY IS OUT TO PROVE IEX HAS WHAT IT TAKES TO BECOME A PUBLIC STOCK EXCHANGE.

PHOTOGRAPHS BY **ALAN CLARKE**

Brad Katsuyama never thought he'd be famous.

Not even famous-for-Wall-Street famous. He was Canadian, for heaven's sake. He'd worked at Royal Bank of Canada, not Goldman Sachs or JPMorgan. He was running a startup—and not one that made anything you could download from the App Store. So even after Michael Lewis interviewed him for *Flash Boys*, even after Lewis flew to Toronto to talk to his parents and high school friends, even after he discovered Lewis had actually made him—Brad Katsuyama—the book's hero, even after the *60 Minutes* camera crew showed up ... even then, Katsuyama says, he didn't quite grasp what was about to happen. "I thought I could kind of blend in," he says between spoonfuls of granola and yogurt at a lower Manhattan restaurant. "You know, Asian guy, normal haircut."

Lewis's 2014 best-seller—with its controversial premise that the U.S. stock market is rigged—made Katsuyama, 37, a celebrity. "People recognize me, which is a little weird," he says. He's testified before the U.S. Senate. He's been invited to join a U.S. Securities and Exchange Commission advisory panel. In April 2014, he bested William O'Brien, then president of Bats Global Markets, in a CNBC debate that transfixed Wall Street and became known simply as "The Argument." He's sold his life story to Sony Pictures. He even considered employing a bodyguard. On Lewis's suggestion, he's stopped reading much of what's written about him. "The less time I spend thinking about it, the more normal I feel," he says.

What Katsuyama does spend his time thinking about is IEX, the upstart stock-trading venue he co-founded in 2012. IEX's goal: to level the playing field between high-frequency traders and everyone else.

When Katsuyama was a senior trader at Royal Bank of Canada, he found that he was increasingly unable to execute orders at the prices and volumes his trading screens indicated were available. He came to see high-frequency trading, public stock exchanges, and the fragmented nature of the U.S. markets as the culprits: High-frequency traders could use their superior speed to take advantage of what's called

At IEX in Manhattan, **Brad Katsuyama**, right, poses with Chief Strategy Officer **Ronan Ryan**, center, and Chief Operating Officer **John Schwall**, left.

latency arbitrage, exploiting minuscule differences in the time it takes various markets and traders to receive data and execute orders. Latency arbitrage forces slower investors—pretty much anyone who isn't a high-frequency trader—to pay more. "The harm to most people is very small, but that small harm adds up to a large benefit for the few who take advantage," says billionaire David Einhorn, manager and founder of hedge fund firm Greenlight Capital and an early investor in IEX.

His co-workers call **Daniel Aisen** 'Puzz'—the nickname he earned after the team he was on won the Microsoft College Puzzle Challenge in 2007.

Katsuyama and the small group who joined him in founding IEX Group took on high-frequency trading, or HFT, with a cleverly engineered speed bump that slows down all incoming orders just enough to defeat most latency arbitrage strategies. But what IEX is really marketing is something less tangible and more fundamental: a fairer market. Katsuyama says the fragmented market structure in the U.S. is riven with conflicts of interest. With trading currently spread over 11 public stock exchanges and more than 40 dark pools (trading venues that don't publish pre-trade prices or volumes), market operators are dependent on HFT firms for liquidity and revenue. To cater to them, the exchanges sell advantages to HFT firms: myriad special-order types, faster data, price rebates, and co-location—the right to put their computers in the same data centers as the exchange's so they can trade even faster.

Katsuyama, who was a tailback on his high school football team, uses a sports analogy to explain his objections. "No one," he says, "is saying the teams have to be equal—just that the referee shouldn't have an interest in the game's outcome." Positioning itself as the honest referee, IEX forbids co-location, charges both sides of a transaction the same fee, gives away its real-time market data feeds, and offers just five order types.

Since *Flash Boys* was published in March 2014, IEX has become one of the largest U.S. dark pools. Already backed by some of Wall Street's biggest hedge fund managers, it has attracted serious venture capital. Many brokers say IEX has pushed U.S. equity markets toward greater transparency and simplicity, although its critics say it has merely accelerated trends previously under way. They also accuse IEX of hypocrisy—demonizing HFT in its marketing while relying on fast-trading firms for liquidity. Even some of IEX's supporters say it's been hyped as a panacea. "IEX doesn't solve all problems," says Brian Levine, co-head of global equities and execution at Goldman Sachs, which has sent some of its order flow to IEX but also has its own dark pool. While Katsuyama was right to tackle latency arbitrage, Levine says, "IEX is not the be-all and end-all."

Now, IEX faces its greatest challenge. In mid-August, IEX spokesman Gerald Lam said the firm was about to file an application with the SEC to become a public stock exchange. Being an exchange brings a host of benefits and increased prestige, but it also brings far greater SEC oversight. The move, which would compel brokers to send more business to IEX and also allow IEX to compete for lucrative public stock offerings, could catapult Katsuyama's startup into the big leagues. It's a threat that existing exchanges take seriously: Even before IEX's first day of trading in October 2013, Intercontinental Exchange, owner of the New York Stock Exchange, offered to buy the startup for hundreds of millions of dollars.

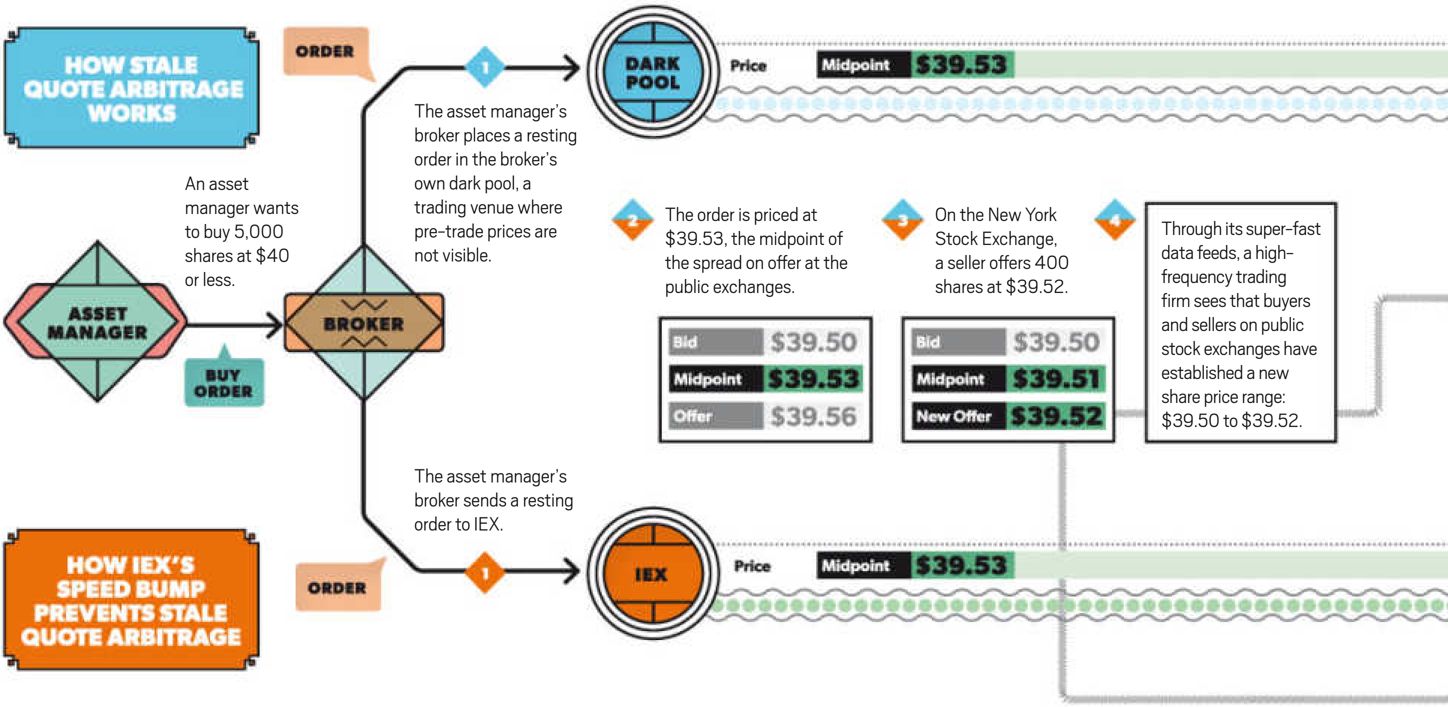
Still, IEX's attempt to become an exchange could backfire. There's no guarantee the SEC will approve IEX's innovative design or that IEX will be able to wrest market share away from goliaths such as the NYSE, Nasdaq, and Bats. It could wind up forfeiting its position as a leading dark pool only to become a second- or third-tier exchange, possibly impairing its financial viability. (With the exception of the Chicago Stock Exchange, all currently operating U.S. public exchanges are subsidiaries of companies that run multiple exchanges.)

Around IEX, where innovation is crucial to continued success, Daniel Aisen, a 28-year-old Stanford University computer science grad, is known simply as "Puzz." It's short for "Puzzle Master," the nickname he got when he worked with Katsuyama at RBC; Aisen's team won the 2007 Microsoft College Puzzle Challenge, a kind of brainteaser olympiad.

In the summer of 2014, Puzz had another puzzle to solve. From March to July, the frequency with which an IEX customer could have gotten a better price less than 10 milliseconds after a trade posted rose from about 3 percent to as much as 10 percent. This wasn't meant to happen. IEX was supposed to protect investors from what's known as stale quote arbitrage; that's when a high-frequency trader takes advantage of milliseconds-long delays in how markets update prices to reflect

SPEED KILLS

In this hypothetical example, a high-frequency trader uses 'stale quote arbitrage' to pick off an asset manager's order on a conventional dark pool, while IEX's technology prevents the order from falling victim to the same strategy.



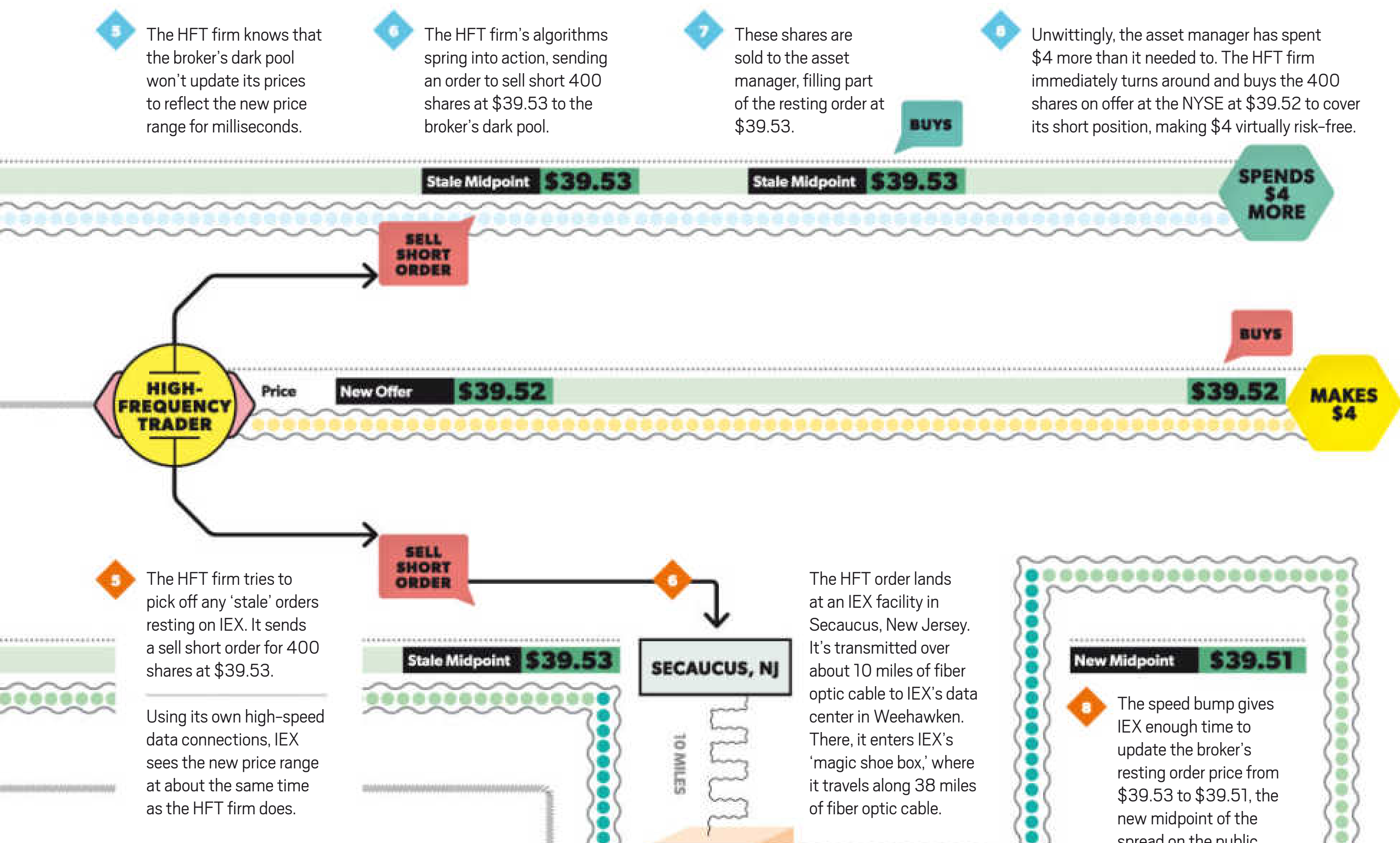
movements on other exchanges. (See chart above.) These tiny delays allow high-speed traders to see a price fluctuation on one exchange and then quickly send an order to another market—often a dark pool—that it knows updates its prices more slowly, hoping to pick off the orders resting there at stale prices. It's a bit like betting on yesterday's horse race against someone who doesn't know the result.

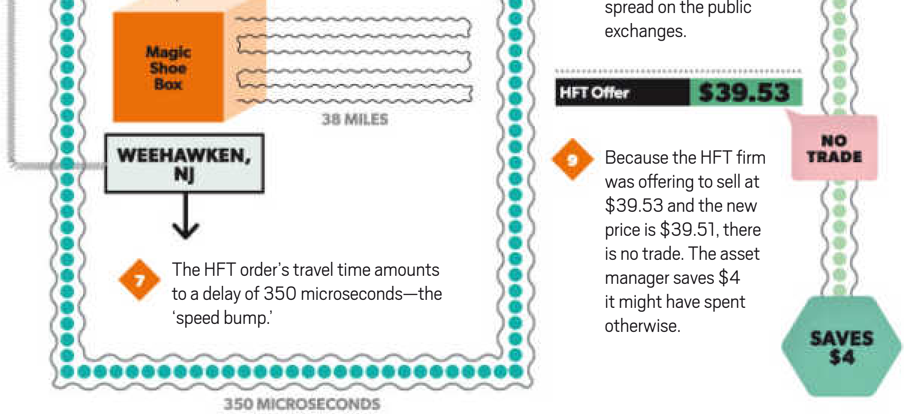
IEX prevents stale quote arbitrage with its "magic shoe box," a metal container in its data center in Weehawken, New Jersey. Crammed into it are 38 miles (61 kilometers) of coiled fiber-optic wire, creating IEX's speed bump of 350 microseconds (about one one-thousandth of the time it takes to blink). The idea of countering super-fast traders by creating a slower market might seem like a paradox. It's not. IEX uses the same high-speed data feeds as HFT firms do to monitor other exchanges for price changes. But because IEX didn't want to be in a technological arms race with the high-frequency traders to process this information faster than they do, it uses the speed bump to slow down all new orders—just enough to ensure IEX has time to update its prices to reflect any movements on public exchanges. This prevents orders on IEX from being traded against at stale prices.

So how, Aisen wondered, could HFT firms be picking off IEX orders despite the magic shoe box? It didn't take Puzz long to solve the riddle. He discovered that some HFT algorithms could predict price changes—like surfers sitting out past the break, scanning the swell for their next ride—and target orders before the magic shoe box's speed bump could protect them. As a defense, Aisen helped IEX create its own price-change-prediction software and a new order type (the discretionary peg, or D-peg for short) that trades less aggressively when prices are in transition, shielding customers from this form of latency arbitrage, too. He says IEX has to remain constantly vigilant against evolving predatory strategies of HFT firms.

Brian Goldman, senior equities trader at Calamos Investments, which has $24 billion under management, says he gets better-quality execution on IEX compared with other platforms. "On a lot of other venues, you can just tell that the HFT guys have seen you coming a mile away and trade directionally in front of you with the intention of picking you off," he says. "We've not observed this sort of adverse movement in the stock we're trading on IEX."

IEX's office on the 44th floor of the new 4 World Trade Center building, with views of the 9/11 Memorial, looks like many trading floors: open plan, exposed ductwork, glassed-in conference rooms. But the vibe is more Birkenstock than brogue. There's a communal kitchen and lots of dudes in shorts and T-shirts. Anachronistically, on a pedestal in the middle of the room, sits a shiny silver bell. Each morning, one employee gets to ring open IEX's market at 9:30. If that day's volume exceeds the previous day's, the same person gets to ring the bell the next morning.





The longest run anyone has had so far is four consecutive days. Even so, since its launch, IEX has steadily gained market share. On the June day I visited, cheers erupted shortly after 11 a.m. as IEX hit a new milestone: trading more than 1.5 percent of all U.S. equity volume. A few weeks later, on Aug. 4, it hit another record—1.86 percent of U.S. volume.

That may sound like nothing. But in today's fragmented market, 1.86 percent is something. The NYSE and Nasdaq, which run three public exchanges apiece, and Bats, which owns four, each control around 20 percent of U.S. equity volume most days. IEX, with from 1.1 to 1.9 percent of total volume, consistently ranks third or fourth among dark pools, trailing those operated by Credit Suisse Group and UBS and sometimes Deutsche Bank's. More than 160 brokers now connect to IEX, up from just 35 at the outset.

Matt Waldner, head of U.S. equity trading at Columbia Threadneedle Investments, a global money manager that sends a portion of its trades to IEX, says the new market's initial success with big brokerages such as Goldman Sachs and JPMorgan Chase has had a snowball effect. "I think the traction they've gained," he says of IEX, "has propelled them past critical mass and forced people to begin routing orders there."

If IEX becomes a public exchange, John Schwall, an IEX co-founder and the firm's chief operating officer, is confident its market share will grow significantly. The SEC requires brokers to route orders to whichever exchange is offering the best price for a stock at any given moment. The same rules don't apply to dark pools, so right now, brokers can choose not to send IEX any orders or to send orders in ways that minimize their chances of being filled.

That's what happened after IEX

launched. In April 2014, 55 percent of brokers' orders routed to IEX were immediately canceled if they weren't instantly filled. "Let's just say they didn't embrace us," Ronan Ryan, another IEX co-founder and the company's chief strategy officer, says of the brokers. Now, brokers show IEX more respect: That number has dropped to less than 16 percent.

Traditionally, dark pools were black boxes. Investors had no idea how orders were processed. IEX, in part because it always intended to become an exchange, has pushed for greater transparency. It was the first dark pool to publish its Form ATS, an SEC filing that details how it prioritizes, prices, and matches orders. About a third of all dark pools have followed suit. "That is a huge step in terms of transparency," says Haim Bodek, a former high-frequency trader who turned SEC whistle-blower.

'I thought I could kind of blend in,' Katsuyama says of life after Flash Boys. 'You know, Asian guy, normal haircut.'

Not everyone sees it that way. Form ATS is a dense legal document. "They are not written in a way that makes it easy for people to evaluate what is happening," says Eric Hunsader, CEO of Nanex, a firm that provides real-time market data, and a prominent critic of HFT. Still, he says, IEX has shifted the debate from "Why would a dark pool bother publishing?" to "What are they hiding if they don't?"

While Lewis cast IEX as the hero of a story in which HFT was the villain, a few high-speed firms are among IEX's best customers. Brokers trading their own principal—they include both HFT firms and the big banks' proprietary trading desks—account for 23 percent of IEX's trades.

HFT firms are present on IEX in such numbers because, contrary to the premise of *Flash Boys*, HFT practitioners aren't predators, says Bill Harts, chief executive of the Modern Markets Initiative, an HFT industry association founded by four large firms (Global Trading Systems, Tower Research Capital, and Hudson River Trading in New York and Houston-based Quantlab Financial). Harts says HFT firms that are IEX customers are providing liquidity—narrowing the spread between buyers and sellers—"just as they do on most other venues in the world." As for IEX's magic shoe box, Harts says, it's basically a marketing gimmick. He says there's no convincing evidence that latency arbitrage even happens.

Comments like that infuriate Katsuyama, who says Harts and Modern Markets are part of "the giant smoke monster" that spreads confusion through oversimplification, twisting the facts in order to preserve the status quo. "We are trying to talk about calculus, and these guys are trying to say two plus two equals five," he says. The problem, he says, is that the general public knows so little about how stock trading in the U.S. actually works that they can't tell the difference between the nuanced, sophisticated arguments he's advancing and the simplistic untruths he accuses Harts of peddling.

Katsuyama says that despite the

Doug Cifu, CEO of HFT firm Virtu, says he likes the trade protection afforded by IEX's speed bump.


What's missing from your clients' portfolios?
New opportunities for alternative income.
ClearBridge Tactical Dividend Income Fund (CFLGX) is an innovative income strategy, providing:
A distinct investment mix that goes beyond traditional income sources
Convenient access to a range of income-seeking securities in a single investment
Greater opportunities for attractive income, plus the growth potential of stocks
Drive your clients to consider alternative income options.
Visit www.clearbridge.com/income.
ClearBridge Investments
A Legg Mason Company

perception created by *Flash Boys*, IEX was never anti-HFT. Rather than labeling some HFT outfits "good" and others "bad," Katsuyama prefers to talk about HFT strategies that are "predatory" versus those that provide "legitimate market making." He says that IEX, with its speed bump and D-peg, prevents high-speed traders from engaging in predatory tactics such as latency arbitrage. But, he says, high-speed traders are free to act as market makers on IEX. He also acknowledges some HFT firms may try to pick up signals on IEX they can then use, ironically, to engage in predatory tactics on other dark pools that update their prices much more slowly than IEX. To make this less likely, IEX uses a second speed bump when relaying information back to the customer.

IEX has repeatedly praised one HFT firm in particular: Virtu Financial, which is not a member of the Modern Markets trade group. Katsuyama says Virtu engages in legitimate market making—taking the spread by buying at the offer and selling at the bid—and not predatory arbitrage. Doug Cifu, Virtu's CEO, says his firm has supported IEX from the start precisely because it is a market maker. He says Virtu likes IEX's speed bump. "No one has more quotes in the market than a Virtu Financial, so if anyone is in danger of getting picked off, it's us," he says.

Modern Markets Initiative's **Bill Harts** disputes the idea that HFT firms are predatory.

R**onan Ryan, IEX's strategy officer,** is standing in a conference room, in front of a whiteboard, explaining why the existing U.S. stock exchanges are screwed. As public companies, under shareholder pressure for ever-increasing quarterly earnings, they've become addicted to speed, Ryan says: "You have revenue in your back pocket in terms of latency—just make that cable two microseconds faster and mark it up 30 percent."

If IEX becomes an exchange and starts stealing significant market share, the existing exchanges will struggle to respond without sacrificing revenue. Every move they might make to match IEX's anti-speed innovations—forbidding co-location, creating a speed bump, cutting back on order types, charging both sides of a trade the same amount, or giving away market data feeds—will mean surrendering something from which they currently make significant amounts of money or that helps drive trade volume to their exchange, Ryan says. As Lewis says in a telephone interview from his home in Berkeley, California, "I would not want to be a long-term investor in Nasdaq right now."

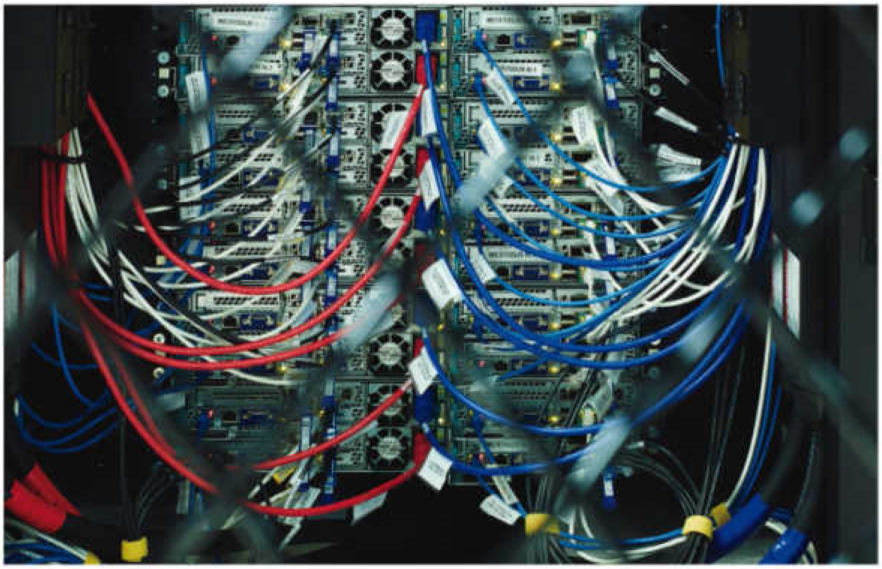
Nasdaq says it's not beholden to high-speed traders for revenue: What are known as "high-order-to-trade customers"—a stand-in for HFT firms—account for at most 11 percent of its equities and options revenue. Walt Smith, Nasdaq's head of U.S. equities, says that predatory HFT is less of a problem than IEX claims. "If it was overly toxic and bad, the largest stock exchange in the U.S. by volume traded would not be the Nasdaq," he says, noting that investors would choose to route orders elsewhere.

'If it was overly toxic and bad,' Nasdaq's Walt Smith says of high-frequency trading, 'the largest stock exchange in the U.S. by volume traded would not be the Nasdaq.'


VOO
Vanguard S&P 500 ETF
A low-cost way to give your clients access to 500 U.S. powerhouses.
Are you Vanguarding® your clients' portfolios?
The Vanguard S&P 500 ETF seeks to track the largest U.S. companies from America's top industries. It's a low-cost option available from the industry's low-cost leader for over 40 years — Vanguard.*
Find more cost-conscious choices at advisors.vanguard.com/VOO today.
800 871-3891
Vanguard®
All investing is subject to risk, including the possible loss of the money you invest.
Vanguard ETF Shares are not redeemable with the issuing Fund other than in Creation Unit aggregations. Instead, investors must buy or sell Vanguard ETF Shares in the secondary market with the assistance of a stockbroker. In doing so, the investor will incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.
For more information about Vanguard ETF Shares, visit advisors.vanguard.com/VOO, call 800 871-3891, or contact your broker to obtain a prospectus. Investment objectives, risks, charges, expenses, and other important information are contained in the prospectus; read and consider it carefully before investing.
*Source: Morningstar as of 05/01/2015. Based on 2015 industry average expense ratio for S&P 500 Index Objective Fund ETFs of 0.08% and Vanguard S&P 500 ETF expense ratio of 0.05%.
S&P® and S&P 500®, are registered trademarks of Standard & Poor's Financial Services LLC ("S&P") and have been licensed for use by S&P Dow Jones Indices LLC and its affiliates and sublicensed for certain purposes by Vanguard. The S&P 500 index is a product of S&P Dow Jones Indices LLC and has been licensed for use by Vanguard. Vanguard S&P 500 ETF is not sponsored, endorsed, sold, or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates, and none of S&P Dow Jones Indices LLC, Dow Jones, S&P, nor their respective affiliates makes any representation regarding the advisability of investing in such product(s).
© 2015 The Vanguard Group, Inc. All rights reserved. U.S. Patent Nos. 6,879,964; 7,337,138; 7,720,749; 7,925,573; 8,090,646; and 8,417,623. Vanguard Marketing Corporation, Distributor.
Follow us @Vanguard_FA for important insights, news, and education.
TYPE VETF <GO>

A disruptor whose model can not easily be mimicked by incumbents is catnip to venture capitalists, which is why IEX has had little trouble raising money. "It's a classic innovator's dilemma: The existing stock exchanges can't change their business model," says Alex Finkelstein, a general partner at Spark Capital in Boston, which led IEX's latest financing round. Finkelstein was on vacation in the Turks and Caicos Islands and reading *Flash Boys* by the pool when he struck up a conversation with a trader who was also reading it. "I asked him if this was really the way it works. He said, 'If anything, it's worse,'" Finkelstein recalls. The morning he got back from vacation, he cold-called Katsuyama. Within weeks, IEX had raised $75 million from Spark and a group that includes Bain Capital Ventures and MassMutual Ventures, as well as Netscape Communications founder Jim Clark and casino mogul Steve Wynn.

It's far from certain, however, whether IEX can become an exchange while preserving its innovative structure. One unique feature of IEX is broker preferencing. Currently, if a broker has a buy order resting on IEX and then submits a matching sell order, those orders get to trade against one another first, jumping ahead of a match already submitted by anyone else. What's more, the matching broker doesn't get charged. IEX implemented this system to overcome the tendency of some brokers, including big banks, to route trades to their own dark pools. The SEC frowns on the practice because it disadvantages independent market makers and smaller brokerages. So IEX has decided to drop it from its exchange application.



At a building in Weehawken, New Jersey, **servers** house IEX technology that matches tens of millions of buy and sell orders every day.

A bigger question for IEX is whether its vaunted magic shoe box will survive. Regulation National Market System, the 2005 SEC rule that created the current U.S. market structure, says quotations must be "immediately accessible" and defines immediate as "precluding any coding of automated systems or other type of intentional device" that would delay them. Smith says that in 2010, when Nasdaq was starting PSX, the smallest of its three exchanges, it nixed incorporating a speed bump after the SEC indicated it would likely object.

Katsuyama believes IEX's speed bump will pass muster, largely because it's designed to create a fairer market. More and more, the SEC has questioned whether fast trading hurts average investors. SEC Chairman Mary Jo White, in a June 5, 2014, speech, wondered whether current SEC rules should be revised so they don't impede "initiatives that seek to de-emphasize speed."

Even if IEX becomes an exchange, its pricing may hobble its prospects. Simply put, IEX is expensive. It charges each side of a completed trade 9 mils (9 cents per 100 shares). On competing exchanges, brokers can pay as little as 2 mils after rebates. Those exchanges also have tiered pricing: The more volume a broker sends, the less it pays per share. That makes it harder for an upstart such as IEX to steal business, because brokerages are loath to lose this discount. Don Bollerman, IEX's head of markets and sales, says the price difference between IEX and its competitors isn't as great as it seems when one considers that IEX doesn't charge for data or co-location. He also says that as IEX grows, it should be able to lower prices.

Over breakfast, the silhouette of the new Freedom Tower visible through the window behind him, Katsuyama reflects on his decision to leave banking. He says he was increasingly troubled by the way money on Wall Street bred corruption, encouraging people to make poor ethical decisions. Planning to start a family, he and his wife, Ashley , who grew up in Jacksonville, Florida, had considered leaving New York and Wall Street behind. But first, Katsuyama wanted to try creating IEX. "If this is my last stop on Wall Street," he says, "I'm OK with it." After all, Katsuyama never wanted to be anything other than what he is: a normal guy who thought he could build a better stock exchange. BM

BLOOMBERG TIPS

Tracking Trading

For an overview of the volume of U.S. equities traded on various venues, you can use the Market Volume Snapshot (MVS) function. Type **MVS <Go>** on the Bloomberg Professional service. For a pie chart showing a month's average volume on IEX and other trade-reporting facilities, click on the TRF Volume tab. For headlines of news stories related to market structure, type 1 <Go>. To view IEX's tweets, type **TWTR <Go>**, enter *IEX* in the field, and click on the iextrading Twitter Feed item in the list of matches. Type **TCA <Go>** to analyze the costs of various execution strategies for a selected stock. Type **BEMS <Go>** for information on Bloomberg's Execution Management Solutions. JON ASMUNDSSON

Blythe Masters, here with her dogs in her Manhattan townhouse, left JPMorgan last year and has become CEO of a software startup.

BY EDWARD ROBINSON AND MATTHEW LEISING

THE INNOVATORS

SELLING THE BLOCKCHAIN TO WALL STREET

Blythe Masters, who helped give the world credit-default swaps, wants to upend finance again—this time with the code that powers bitcoin.

PHOTOGRAPHS BY **GUZMAN**

The penthouse meeting room in Le Parker Meridien hotel in midtown Manhattan is humming with chatter on this June afternoon. About a hundred money managers are networking at the end of the day at a Sandler O'Neill & Partners investor conference as the green rectangle of Central Park stretches into the distance 42 floors below. With neckties loosened and icy drinks in hand, the attendees largely ignore the founder of a fintech startup who's presenting a PowerPoint about his investing smartphone app. But when the next guest takes the floor, the room falls silent. ¶ These Wall Street veterans all know who Blythe Masters is. She's the wunderkind who made managing director at JPMorgan Chase at age 28, the financial engineer who helped develop the credit-default swap and bring to life a market that peaked at $58 trillion, in notional terms, in 2007. She's the banker later vilified by pundits, unfairly some say, after those instruments compounded the damage wrought by the subprime mortgage crash in 2008. Now, one year after quitting JPMorgan amid another controversy, Blythe Masters is back. She isn't pitching a newly minted derivative or trading stratagem to this room. She's promoting something wilder: It's called the blockchain, and it's the digital ledger software code that powers bitcoin.

Masters is the CEO of Digital Asset Holdings, a New York tech startup. She says her firm is designing software that will enable banks, investors, and other market players to use blockchain technology to change the way they trade loans, bonds, and other assets. If she's right, she'll be at the center of yet another whirlwind that will change the markets.

"You should be taking this technology as seriously as you should have been taking the development of the Internet in the early 1990s," Masters, a lithe 46-year-old Englishwoman with auburn hair and the proper diction of the Home Counties, explains to the rapt audience. "It's analogous to e-mail for money."

That's a bold statement, but Masters isn't the only voice heralding the coming of the blockchain. The Bank of England, in a report earlier this year, calls it the "first attempt at an Internet of finance," while the Federal Reserve Bank of St. Louis hails it as a "stroke of genius." In a June white paper, the World Economic Forum says, "The blockchain protocol threatens to disintermediate almost every process in financial services."

In a matter of months, this word, *blockchain*, has gone viral on trading floors and in the executive suites of banks and brokerages on both sides of the Atlantic. You can't attend a finance conference these days without hearing it mentioned on a panel or at a reception or even in the loo. At a recent blockchain confab in London's hip East End, the host asked if there were any bankers in the room. More than half the audience members, all dressed in suits, raised their hands.

Now, everyone's trying to figure out whether the blockchain is just so much hype or if Masters's firm and other startups are really going to change the systems that process trillions of dollars in securities trades. When investors buy and sell syndicated loans or derivatives or move money around the world, they must cope with opaque and clunky back-office processes that rely on negotiated contracts between buyers and sellers, lots of phone calls, lots of lawyers, and even the occasional fax. It still takes almost 20 days, on average, to settle syndicated loan trades.

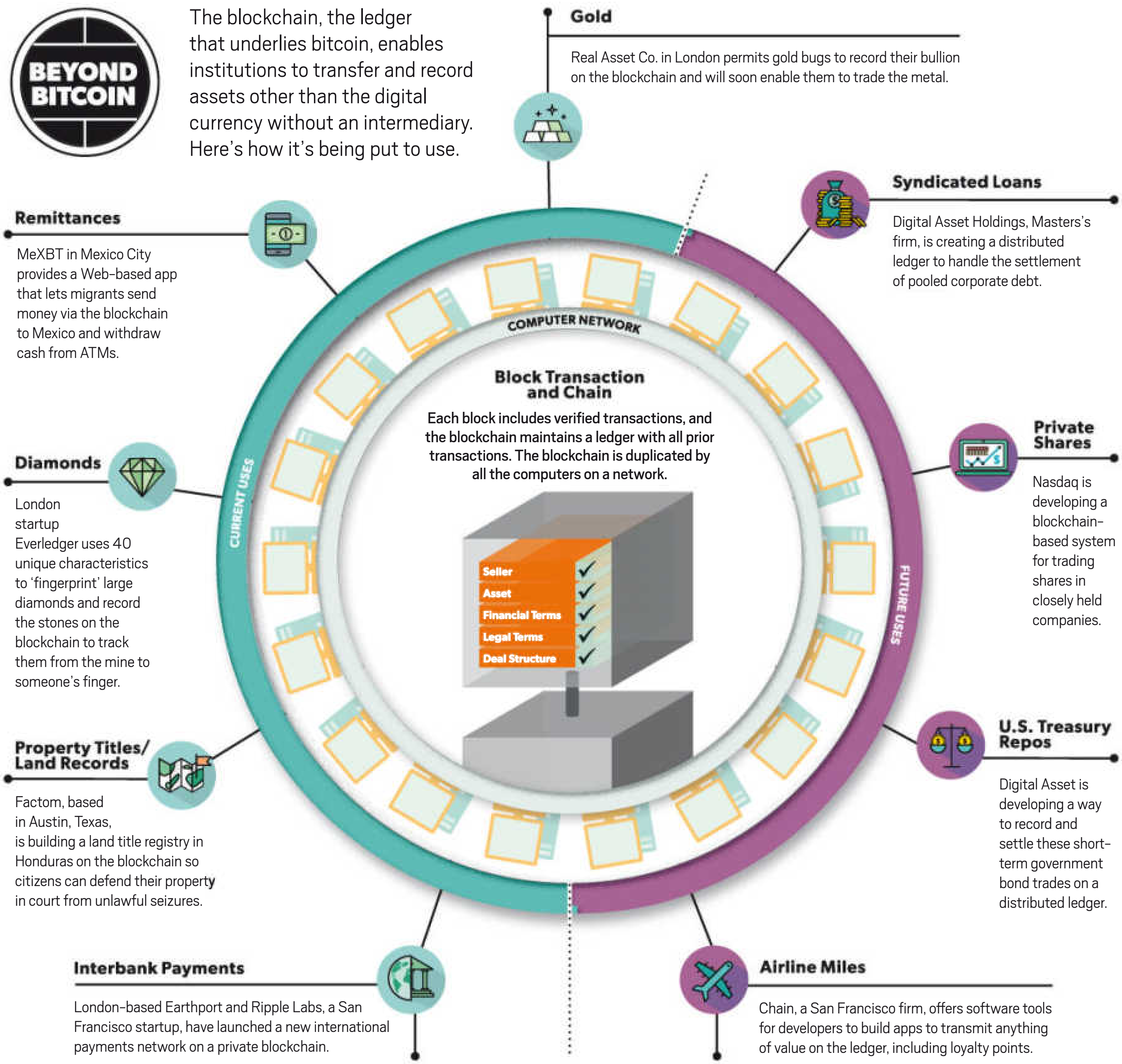
Masters is betting that the blockchain, the breakthrough that permits people to buy and sell bitcoins without the need for an intermediary, can be used to streamline all manner of financial transactions. A June report backed by Santander InnoVentures, the Spanish bank's fintech investment fund, estimated the blockchain could save lenders up to $20 billion annually in settlement, regulatory, and cross-border payment costs.

"You have front-end systems trading at warp speed, and nanoseconds of competitive advantage are being extracted, and yet the back end of Wall Street hasn't been fundamentally overhauled in decades," Masters says in an interview at her offices in Manhattan's Flatiron District. "Firms are dealing with greater

requirements for reporting, transparency, and dissemination of data. Costs have gone up and revenues have gone down. This technology really gets to the core of all those issues."

That's why there's been a Cambrian explosion of blockchain startups, accelerators, and skunkworks in London, New York, and Silicon Valley. In April, UBS installed a half dozen developers in London's Level39 accelerator to download blockchain source code from the Internet and delve into how it might revolutionize payments, cybersecurity, and other banking needs. Barclays, Goldman Sachs, the New York Stock Exchange, and Santander are backing cryptocurrency ventures. And no surprise, Marc Andreessen, Jim Breyer, Reid Hoffman, and other denizens of Sand Hill Road are all over this space. Venture capitalists plowed $400 million into dozens of digital currency startups in the first six months of this year, a fourfold jump from all of 2013, according to industry news site CoinDesk.

Some of these ventures are building on the actual bitcoin blockchain. In June, Nasdaq teamed up with Chain, a San Francisco firm, and launched a project to use the blockchain to issue and transfer the equity shares of closely held companies



on the exchange's private marketplace. By contrast, Ripple Labs, another San Francisco company, runs a self-contained network for financial institutions that doesn't rely on bitcoin at all. Masters plans to offer banks and other financial players both options: Digital Asset is creating an off-the-shelf private blockchain product and developing ways to connect its customers to the existing bitcoin system.

Whatever form it takes, the blockchain has the potential to change the very structure of the financial services industry, says Oliver Bussmann, the chief information officer at UBS. "If you brought up bitcoin with bankers 12 months ago, you'd lose their attention immediately," Bussmann says. "Now, everyone sees this as a critical topic. I know of more than 100 firms that are trying to make the blockchain more scalable, more secure, to make the one that everybody will use. There's a race on out there."

Maybe so, but rewiring the market's infrastructure is an awfully big task. So is persuading financial players to place their trust in a system embraced by cryptocurrency anarchists and other fringy characters. Even if market pros do grasp the blockchain's potential, will they buy in? "Look, the technology is potentially great, but you're going to have to bring along all the regulators and the banks to change the ecosystem," says Hank Uberoi, the former co-head of Goldman Sachs's global technology operations and now the CEO of Earthport, a London-based payments venture. (See "The Money Mover," May 2015.) "Change comes very slowly in that world. That's going to be the hardest part."

When it comes to adopting innovation, the financial services industry doesn't exactly have a stellar record. For example, the global interbank payments system, which Uberoi's Earthport is trying to shake up, is managed by a consortium of more than 10,000 institutions. It's so antiquated that it still takes days to send transactions from one part of the world to another. Jon Matonis, a founding director of the Bitcoin Foundation, a Washington group that promotes the cryptocurrency, says a private blockchain run by banks could end up as just "another cartel" and function as poorly as the payments consortium.

'YOU SHOULD BE TAKING THIS TECHNOLOGY AS SERIOUSLY AS YOU SHOULD HAVE BEEN TAKING THE DEVELOPMENT OF THE INTERNET IN THE EARLY 1990S,' MASTERS SAYS OF THE BLOCKCHAIN.

BLYTHE MASTERS SWINGS OPEN THE door of her ninth-floor offices, parks her suitcase, and exhales. Fresh off a flight from London, she's relieved to be back on solid ground. Masters says her airliner was landing when it suddenly roared back into the sky to avoid a collision on the runway. "That's the most dangerous moment I've ever had on a plane!" says Masters, who's dressed in a black knit tunic, black tights, and Burberry-plaid flats.

Her new digs at Digital Asset Holdings, with a worn wooden floor and views of air shafts, are a far cry from the Park Avenue executive suite at JPMorgan. The glass walls are covered in scribbled pieces of code and diagrams with a lot of boxes and arrows. A gray terrier named Luna, the office pooch, scampers under the conference room table. A guest notes that Nasdaq has just hired a "blockchain technology evangelist." "We have a blockchain artist," Masters replies, pointing out the one decorative object in the place, a painting depicting a network of black and blue lines. "That is our COO's homegrown work," she says with delight. "I rather like it."

Born in Oxford and educated in economics at Cambridge, Masters came of age at JPMorgan. At 18, she joined its London office as an intern during a year off before university. By her mid-20s, Masters was working on the bank's derivatives team in New York. She helped design a way to remove lending risk from JPMorgan's balance sheet by getting another party to protect the bank against a default in return for a premium. The contract, which made it possible to bet a bond would fall in value, was dubbed a credit-default swap, and investors fell in love with it. In 1999, Masters, then 30, was named head of the bank's global credit derivatives unit.

"Blythe has about as much wrapped up in one brain as I've ever encountered in finance," says John "Mac" McQuown, cofounder of KMV, a maker of widely used credit analysis tools. McQuown, 81, has known Masters since the early 1990s. "She is inventive, a risk taker, and beyond a doubt a force to be reckoned with."

Masters advanced quickly up JPMorgan's ranks. Following a stint as CFO of its global investment bank from 2004 to 2007, she was appointed chief of a newly formed unit that helped clients manage risk in commodities markets. During the next five years, she built it into a profitable business that oversaw billions of dollars of physical assets. At the same time, Masters served as a board member and then chair of the Securities Industry and Financial Markets Association, known as SIFMA. Along the way, she earned a reputation as that rare figure on the Street, a corporate player with the innovative chops of an entrepreneur.

"You were one of the most powerful women on Wall Street," CNBC host Bob Pisani noted during an onstage interview with Masters at a fintech conference in June.

"What do you mean I *was*?" Masters deadpanned.

Masters had a hard time believing Digital Asset's **Sunil Hirani** was serious when he first talked to her about bitcoin.

After the fall of Lehman Brothers in September 2008, some media outlets highlighted her work with credit derivatives and cast her as one of the instigators of the crash. She became such a target of critics that a French graffiti artist spray-painted her likeness onto the wall of a museum called the Abode of Chaos near Lyon.

In a speech that year at SIFMA's annual conference in New York, she noted that she'd been dubbed "The Woman Who Built Financial Weapons of Mass Destruction." She responded to the swipes by saying the problem wasn't the instrument but the way people used it. "Unfortunately, tools that transfer risk can also increase systemic risk if major counterparties fail to manage their risk exposures properly," she said.

JPMorgan CEO Jamie Dimon backed her all the way through this period, but her fortunes turned in 2013, when the Federal Energy Regulatory Commission investigated whether traders in her commodities division manipulated California's electricity market. JPMorgan paid a $410 million settlement to end the case without denying or admitting wrongdoing; Masters wasn't implicated in the matter. Dimon agreed to sell the business to a Swiss trading firm called Mercuria Energy Group in March 2014, and Masters resigned.

For the first time in her career, she had nowhere to be and nothing to do except hang out with her husband and daughter in her Tribeca townhouse, catch up with friends, and pursue her passion for show jumping. Masters has won first-place ribbons riding her two beloved European warmblood horses, Aslan and Vamos.

Then one day that summer, she grabbed breakfast with Sunil Hirani, an entrepreneur who cofounded Creditex Group, one of the first CDS brokerages. Hirani, 48, an effusive man who's made a fortune at the intersection of technology and derivatives, couldn't stop talking about bitcoin. He was toying with the idea of creating futures contracts around the ersatz currency. He was also forming a startup, Digital Asset, to explore how to apply the blockchain to the markets. He'd teamed up with Don Wilson, the founder and CEO of DRW Trading Group, a Chicago-based market maker and trading firm.

Masters was surprised. Hirani was a shrewd Street vet. He'd sold Creditex for $513 million to Intercontinental Exchange in 2008. Why was he messing around with a technology associated with cypherpunks and anti-Fed libertarians? Wasn't the currency's price cratering amid scandals involving bitcoin-lubricated online drug bazaars and bankrupt bitcoin exchanges? "Can't we talk about something

more serious?" Masters pleaded with her old friend.

Hirani knew that Masters's knowledge of the inner workings of the markets would make her the ideal person to build the firm he envisaged and to sell this new technology to Wall Street. So he persuaded Masters to do some homework. Over the next few weeks, she delved into bitcoin's origins and discussed its potential with Hirani and his colleagues as well as her network of regulators and market players.

SO WHAT, EXACTLY, IS THIS THING that sounds like something you'd build with Lego pieces? Like many innovations in finance these days, the blockchain is code.

In 2009, a mysterious coder named Satoshi Nakamoto released bitcoin and the math that makes it work on the Internet. He (or she or they—Nakamoto has yet to be identified) created a peer-to-peer network to enable people to buy and sell bitcoins and to automatically secure and perpetuate the system. Every 10 minutes, coders around the world known as miners race to be the first to solve mathematical equations and record transactions made with bitcoins as entries, or blocks, on a digital ledger. In return for their work, which requires brute force computing power to complete, the program rewards miners with bitcoins, which motivates them to process transactions faster.

Here's the key part: Every new block is connected to every prior one in a digital chain. So the record of every bitcoin transaction lives on the computers of the miners and is updated with each new entry. That's why the blockchain is also called a distributed or a decentralized ledger. This replication makes the blockchain secure. The only way to tamper with it would be to seize control of most of the computers holding the blockchain in their memories, which miners call the "51 percent attack." Such an assault has a better chance of materializing in the next Bond flick than in reality, says Matonis, who's also an editorial board member at CoinDesk.

As Masters dug deeper into bitcoin, she learned that it was just one of many applications that could run on the blockchain. Startups in London, Silicon Valley, and even Mexico City were already developing ways to use it to transfer and record land titles, airline miles, gold, and diamonds. Masters realized that bitcoin wasn't really about bitcoin—it was all about the blockchain. "I had an aha moment," Masters says.

She then plumbed why the ledger could transmit assets without an intermediary, which would change everything she knew about the way the markets completed trades. Buyers and sellers, of course, can't automatically trust one another. In the fixed-income market, for example, we need middlemen to draw up contracts between buyers and sellers that cover interest payments, terms, and collateral, plus clearinghouses to guarantee the exchange of cash for securities. Through her research, Masters understood how you could input all that information into a digital "smart contract" on a distributed ledger. Conceptually, it's similar to the way you can embed video in an e-mail. But the difference is that when you send that smart contract along, it doesn't just contain data, it transfers ownership of the security. The value belongs to whoever possesses it. So a trade could be settled in minutes instead of days or weeks, Hirani says.

Anyone with access to the ledger can read the contract with a click of a mouse. That means regulators, who depend primarily on self-regulatory organizations to police the markets, could easily verify that a securities transaction didn't violate anti-money-laundering rules or other laws. The blockchain, in essence, automates trust, Hirani says.

'IF YOU BROUGHT UP BITCOIN WITH BANKERS 12 MONTHS AGO, YOU'D LOSE THEIR ATTENTION IMMEDIATELY,' UBS'S BUSSMANN SAYS. 'NOW, EVERYONE SEES THIS AS A CRITICAL TOPIC.'

The clincher for Masters was how the technology can affect risk. Every hour that a trade hangs suspended between sale and purchase, the chances mount that it won't be fulfilled, she says. Institutions have to set aside capital to protect themselves from such failures. Since the 2008 crash, regulators in the U.S. and the European Union have directed banks to set aside ever-larger sums to cover their exposures. If the blockchain could shorten the settlement time for, say, syndicated loans, from 20 days to 10 minutes, this risk would be reduced and capital would be freed up.

"I spent my whole career thinking about risk, markets, infrastructure, and regulation," Masters says. "I had seen the financial crisis unfold, and I had seen the credit derivatives market get operationally ahead of itself, which resulted in systemic risk counterparty exposures. I began to believe that distributed ledgers had the capability to tackle that problem."

BLOOMBERG TIPS

Tracking Blockchain-Related Tweets

You can use the Twitter Filter Builder (TWTR) function to create an alert that will notify you of tweets that include the word *blockchain*. Type **TWTR <Go>**, enter *BLOCKCHAIN* in the field, and click on the Exact Match item. Next, click on the Display & Edit button on the red tool bar and select Set Alert Delivery. In the Delivery Options window, click on the box to the left of Deliver to Alert Catcher and click on Done. Type **BLRT <Go>** for Bloomberg Alert Catcher, a tool that consolidates your notifications. To monitor trading in bitcoins, type **VCCY <Go>**. Type **BI ETEC <Go>** for the Bloomberg Intelligence dashboard on emerging technologies. JON ASMUNDSSON

MACQUARIE
The capital of tomorrow
informatica
$5.3 BILLION
Take-Private by Permira and CPPIB
Financial Advisor
Joint Bookrunner
Pending
LAKES Entertainment, Inc.
$341 MILLION
Merger with Golden Gaming
Financial Advisor
July 2015
ELDORADO RESORTS
$950 MILLION
Senior Secured Credit Facility
Senior Unsecured Notes
Joint Bookrunner
Joint Lead Arranger
Co-Syndication Agent
July 2015
LIFETIME
$4.1 BILLION
Acquisition by consortium led by Leonard Green
Financial Advisor
June 2015
FREEPORT LNG
$4.6 BILLION
Project Financing of Freeport LNG's Third Liquefaction Train
Exclusive Financial Advisor
April 2015
PETSMART
$5.1 BILLION
Financing of acquisition by consortium led by BC Partners
Joint Bookrunner
Joint Lead Arranger
March 2015
Digital River
$842 MILLION
Acquisition by Siris Capital
Exclusive Financial Advisor
February 2015
NEOVIA
Living, breathing logistics
Undisclosed
Sale by Platinum Equity
Joint Sell-side Advisor
February 2015
SunEdison
$2.7 BILLION
Equity & Debt Issuances to Support Acquisition of First Wind
Joint Bookrunner
January 2015
NOVOLEX
$1.2 BILLION
Senior Secured Credit Facilities
Joint Bookrunner
Joint Lead Arranger
Co-Documentation Agent
December 2014
AIR LEASE CORPORATION
$2.0 BILLION
Joint Venture Between Air Lease Corp. / Napier Park Global Capital
Financial Advisor
November 2014
Bally TECHNOLOGIES
$5.1 BILLION
Sale to Scientific Games
Lead Sell-side Advisor
November 2014

In March, Masters joined Digital Asset as CEO. She, Hirani, and Wilson set to work developing blockchain-based software for three inefficient markets they deemed ripe for an overhaul: syndicated loans, U.S. Treasury repos, and equity shares in private companies. At the same time, Masters recognized that the open structure of the bitcoin process—no one controls who does the mining—would be anathema to an industry in which client confidentiality is sacrosanct. So in July, the company acquired Hyperledger, a San Francisco software firm that's developing the technological equivalent of gated communities. Its system is designed so that users will be able to process transactions themselves rather than depend on the open bitcoin blockchain. "With private chains, you can have a completely known universe of transaction processors," Masters says. "That appeals to financial institutions that are wary of the bitcoin blockchain."

While this vision of a superefficient financial world is enticing, let's not forget that Masters and her rivals will have to persuade institutions and regulators to uproot decades of legacy IT systems and practices. And the introduction of the blockchain will make the markets' infrastructure even more complex than it already is, at least in the short term.

Skeptics question whether one piece of code could in a single stroke make finance faster, more transparent, and more efficient. "People are talking about how the blockchain is going to be some kind of Messianic savior for the database industry," says Bradley Howard, the head of digital media at Endava, a London-based IT services provider. "It may be fantastic in some cases, but it could also just be the latest fad."

Yet Masters, who in July joined the board of Santander's U.S. unit as non-executive chairman, is betting that the mindset at the highest levels of finance is changing. The advent of peer-to-peer lending, mobile banking, and other innovations is forcing Wall Street's chieftains to rethink their businesses. She says the blockchain may be the biggest fintech play of them all.

"Blythe sees that a new industry is being created," says Hirani, who's known Masters for 17 years. "There's no infrastructure. There's no companies that have any kind of scale. She's done the bank thing. She did commodities. She did derivatives. She did loan portfolio management. This allows her to bring all of that experience to bear in creating an ecosystem—and a company around it."

Twenty-three years ago, Masters opened up fresh territory with credit derivatives. Now, she's determined to do it again, although this time it's with a technology that was initially designed to bypass the financial system. Masters, with a very British dose of understatement, puts it this way: "I've always been motivated to innovate where the implications are significant." BM

Innovating at Altitude

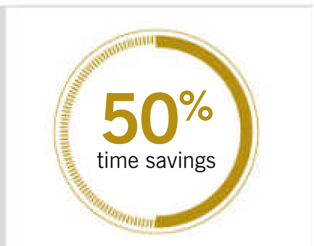
In the world of private aviation, emerging technology offers entrepreneurs better options

When Berkshire Hathaway chairman Warren Buffett finally bought his first private jet, he decided to christen the craft *The Indefensible*. Choosing that name was Buffett's nod to his many historical critiques of executive extravagance—jibes likely to boomerang once the legendary investor bought his own plane. But Buffett didn't just grow accustomed to private aviation; he would later double down by acquiring one of the major aircraft leasing companies, NetJets.

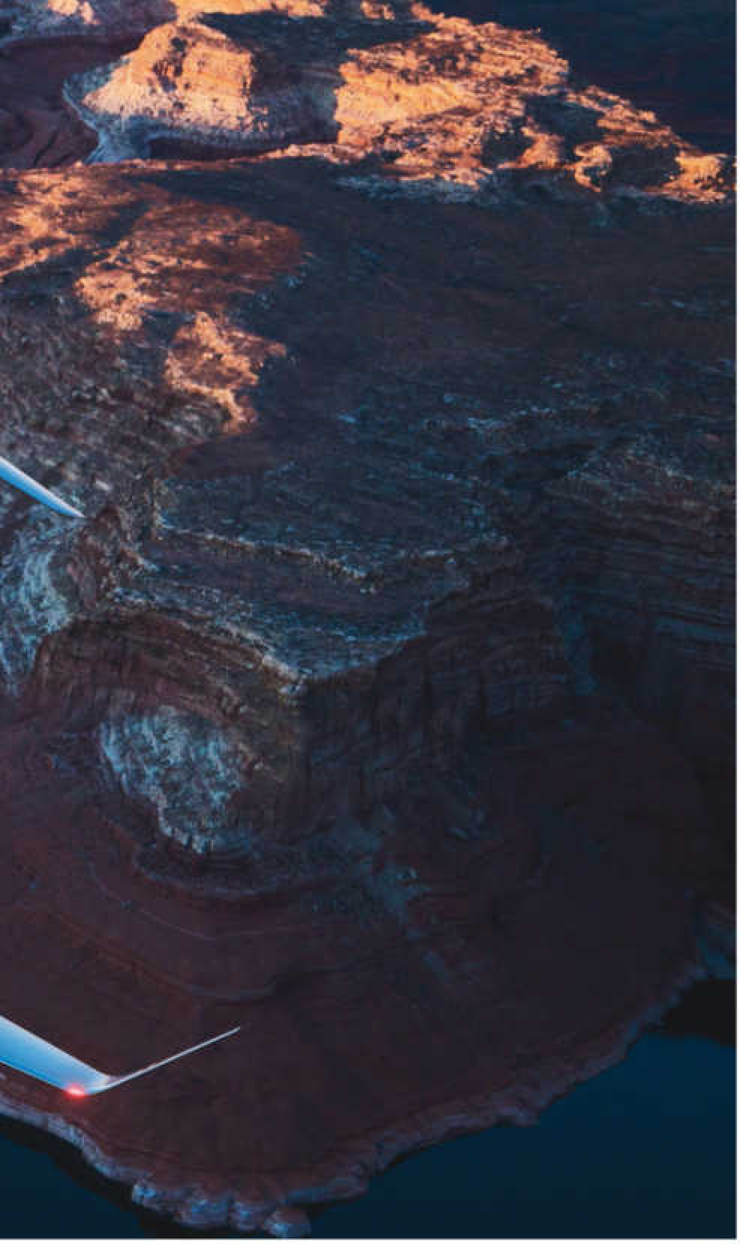
Some businesspeople that crunch numbers for a living may still harbor bias against private-jet travel, convinced that it's not cost-effective for them. However, after weighing the merits of private flying, many grasp that their old way of thinking has resulted in missed opportunities—and trackable hard costs. Statistically, those who fly in a business jet are proven to gain an average 50 percent time savings over those who favor the hub-and-spoke labyrinth of commercial air travel, and there is increased value in the privacy, team cohesion, client service and air-to-ground conferencing provided by a corporate aircraft.

Staring out the window from one of those packed commercial flights, it's easy to spot a business jet headed down the runway, and wonder, *Who are those guys?* According to Steve Cass, Vice President of Communications at Gulfstream Aerospace, there's no real mystery to it. "Wherever you find economies and business sectors growing the fastest," says Cass, "that's where private aviation is experiencing its biggest growth."

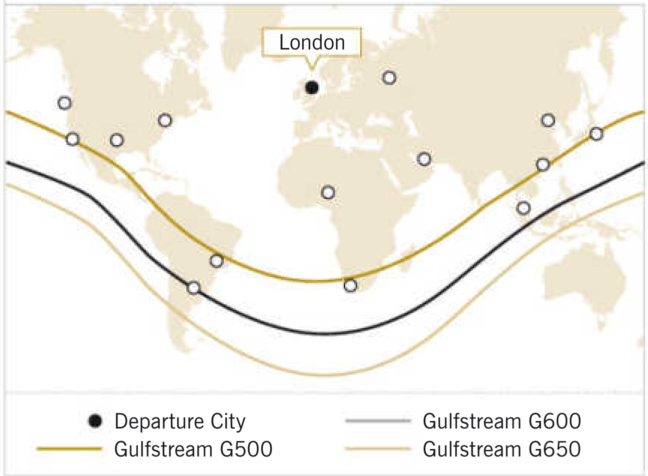
As the only business jet manufacturer that has no other lines of business—it doesn't make commercial aircraft, fighter jets or automobiles—Gulfstream is a bellwether brand for the industry, which finds itself on an upward trajectory. According to a recent independent study from Research and Markets, demand for these sleek machines saw 6.5 percent year-over-year growth in 2014, based on units delivered. Through the year 2033, the long-term trend points toward 2.8 percent annual growth for private jet makers.



The Research and Markets report notes that an important driver of sales growth is the ability of leading brands to produce "cutting-edge technologies and innovations translating into enhanced performance capabilities, safety features and optimized operating economics." Gulfstream, for its part, strives



AIRCRAFT LONG-RANGE MAP (cruising speed)



to exemplify that observation. The Savannah, Ga.-based firm recently introduced its new G500 and G600 airplanes, jets that continue the heritage of its storied GIV-series aircraft, the best-selling business jet ever. The G500 will have a range of some 5,000 nautical miles, at a speed of up to Mach 0.85 (equal to about 560 miles per hour). It can even fly with a bit more velocity—up to 0.9 Mach—at which speed its range reaches 3,800 nautical miles.

The G500 interior is all about quality rather than the ability to hold a large quantity of jammed passengers. The aircraft can carry 18, and provides each passenger with large volumes of personal space while they're seated. And when they stand up, they enjoy the headroom provided by 6-foot, 4-inch ceilings. Pedestal-mounted conference tables can be adjusted for height, while high-speed communications and entertainment gear create an office in the sky or, when work is done, an in-flight media room.

Among the Federal Aviation Administration's innumerable rules, there isn't one requiring cabin windows to be the size of cereal boxes. Panoramic windows line the fuselage of the G500, providing wide views and filling the cabin with natural light. Any business-class traveler can attest that the air quality on a loaded commercial jet can make travel unpleasant, and make recovery from a long flight a productivity issue. But on the G500, 100-percent fresh air permeates the cabin, and is replenished every two minutes.

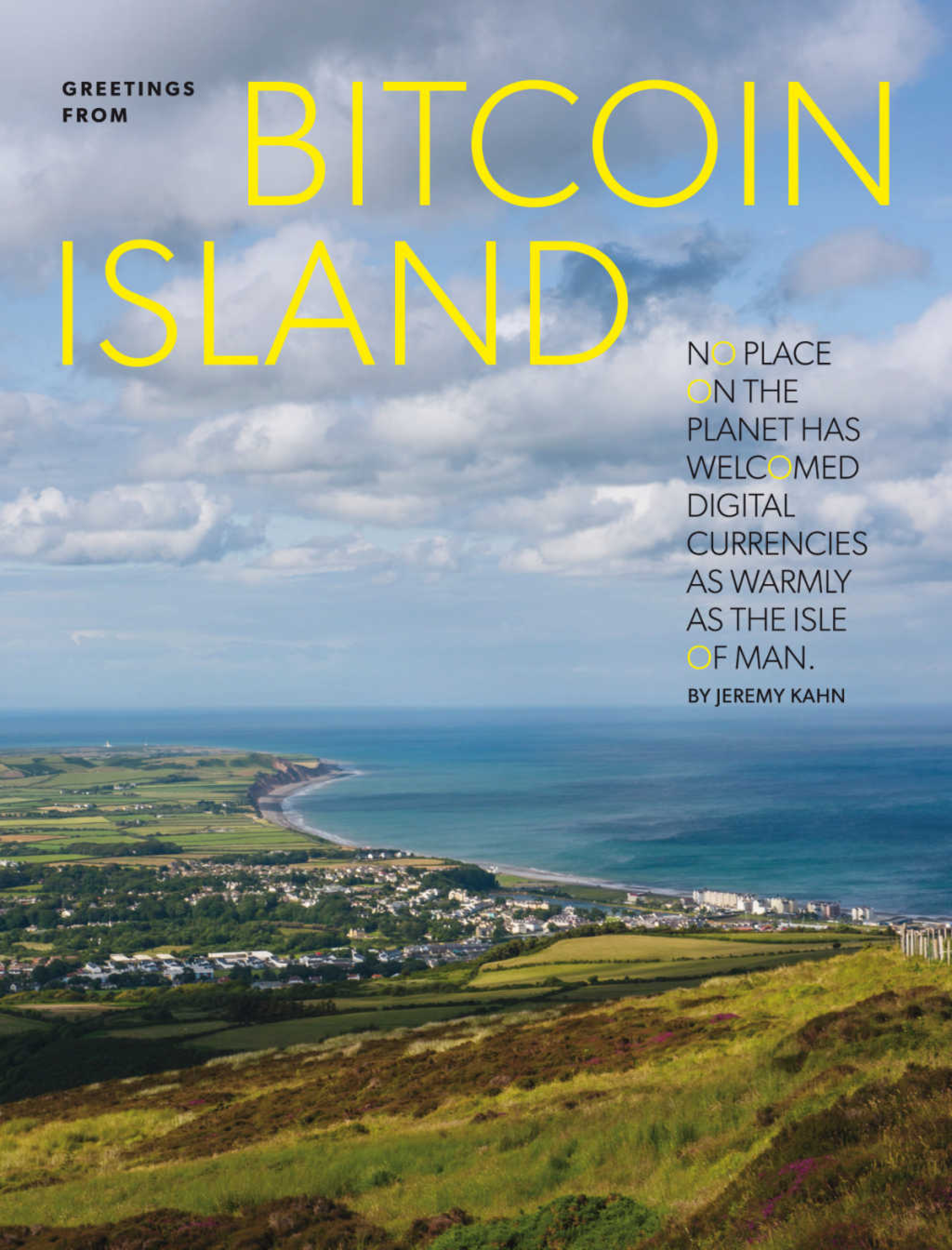
The company works on a customer-based product cycle, filling newly identified needs as they arise; and a formal advisory group was tapped to comment extensively on the features built into the new G500 and its longer-range, longer-cabin sister plane, the G600. (The two models have an $11 million price-point gap between them, with the G500 selling for about $43.5 million and the G600 for about $54.5 million.) Advance sales of the G500 and G600 are extremely encouraging, and comprise a portion of Gulfstream's current $13 billion order backlog.

Another introduction driving sales is the G650ER aircraft, an extended-range version of the G650, which made an impressive debut in 2012. "We got a great response to the G650's rollout," says Cass. "That included demand for a G650 that could fly an additional hour, or roughly 500 more nautical miles."

Essentially, the "ER" designation is a gross weight increase with additional fuel, which can happen on the assembly line with a new airplane, or in the retrofit shop at a cost of about $2 million. "The extra fuel margin this represents can also allow you to fly faster or carry more payload," Cass explains. "It's been a very popular option." The term "city pairs" is industry shorthand to express an aircraft's range without refueling, and the new Gulfstream 650ER can fly nonstop from Los Angeles to Melbourne, Australia.

Businesspeople reluctant to embrace private aviation can find extra persuasion in Gulfstream's ambitious sustainability measures. The company just signed a multiyear contract with a fuel supplier that will allow it to use a 30 percent biofuel mixture made from agricultural waste for its flight tests, its product-support fleet and its demo aircraft, which facilitates a 50 percent reduction in greenhouse gas emissions versus conventional jet fuel.

Faster, more comfortable, more secure and more efficient aircraft provide numerous advantages for business teams that fly in them—all with the promise of achieving environmental innovations, as well. As a result, when it comes to the ideal mode of air travel for executives, anything else seems indefensible. — *David Gould*



GREETINGS FROM

BITCOIN ISLAND

NO PLACE ON THE PLANET HAS WELCOMED DIGITAL CURRENCIES AS WARMLY AS THE ISLE OF MAN.

BY JEREMY KAHN

PHOTOGRAPHS BY **WILL SANDERS**

The Isle of Man is a strange place. Home to four-horned sheep, cats without tails, and perfectly preserved Victorian-era steam locomotives, this rock in the middle of the Irish Sea is perhaps best known for hosting the world's most dangerous motorcycle race, the Manx TT.

It's also a place where, after you take a 70-minute flight from London, a car service called The Lady Chauffeurs will meet you at the airport in a silver Mercedes-Benz S-Class. Imagine my surprise, then, when I'm greeted at arrivals by Keith, who, while courteous, impeccably dressed in a gray suit, and an able driver, is most decidedly not a lady. "All of our regular drivers are busy," says an apologetic Nula Perren, who owns the company and has accompanied Keith to the airport. Not that I mind. I didn't choose The Lady Chauffeurs for its ladies; I booked for the bitcoin.

Lady Chauffeurs is one of a growing number of businesses on the island that accept the digital currency. Bitcoin startups tend to cluster where the venture capital money is: London, New York, San Francisco. Taking on these behemoths might appear to be a stretch for a tiny British protectorate that can seem more time capsule than Tomorrowland. Yet the Manx government is indeed seeking to make the island the world's foremost hub for the technology. Some 25 startups working with digital currencies or the blockchains that

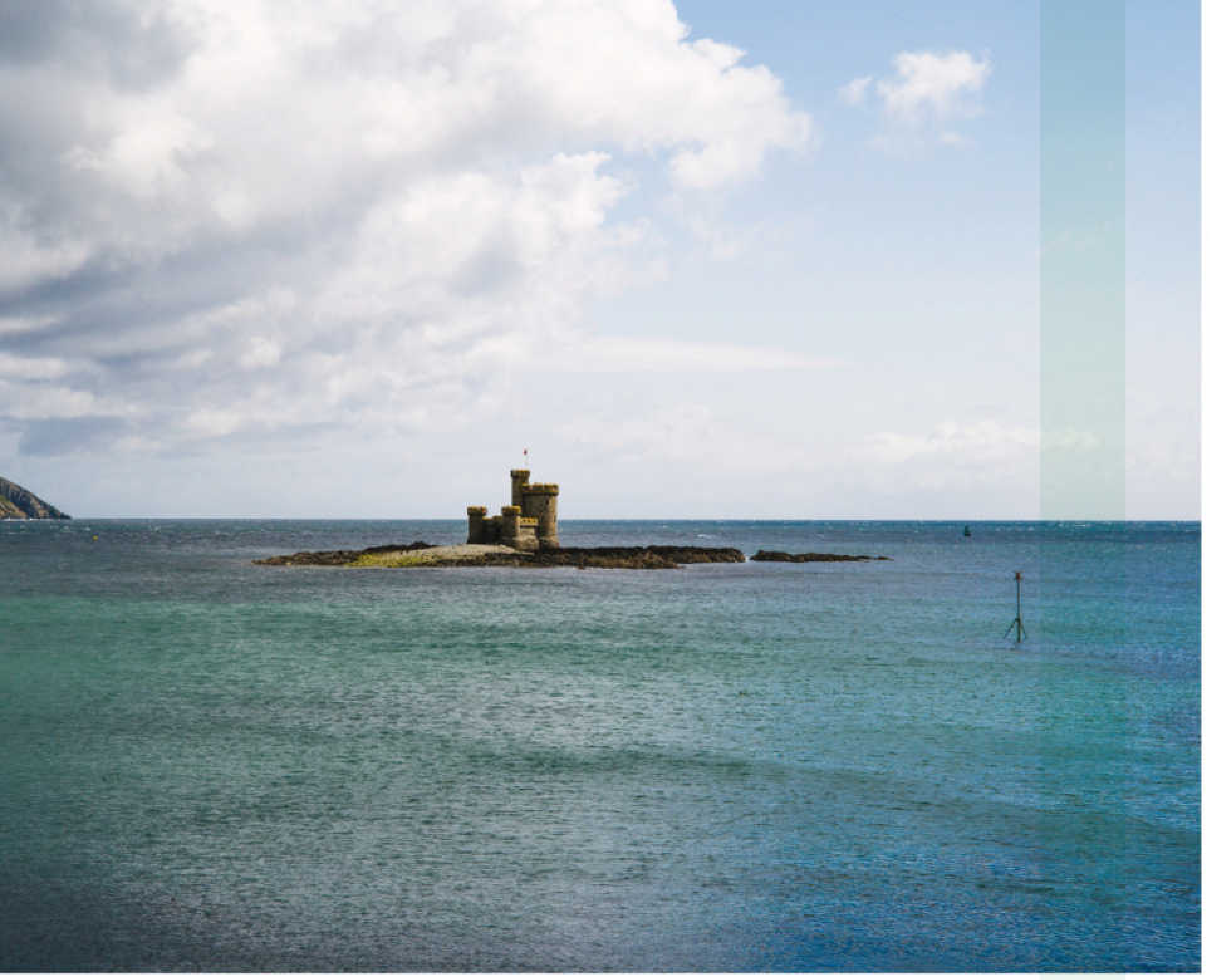
Opposite: Rolling hills meet the sea at the **town of Peel**, on the island's western coast. This page, clockwise: A car service called **The Lady Chauffeurs** accepts bitcoins, one of a few island businesses that do; **Manx cats**, a domestic breed that originated on the island, lack tails; **Nick Williamson**, an American transplant, runs the startup Pythia, which provides off-the-shelf software customers can use to create and run their own customized blockchains.

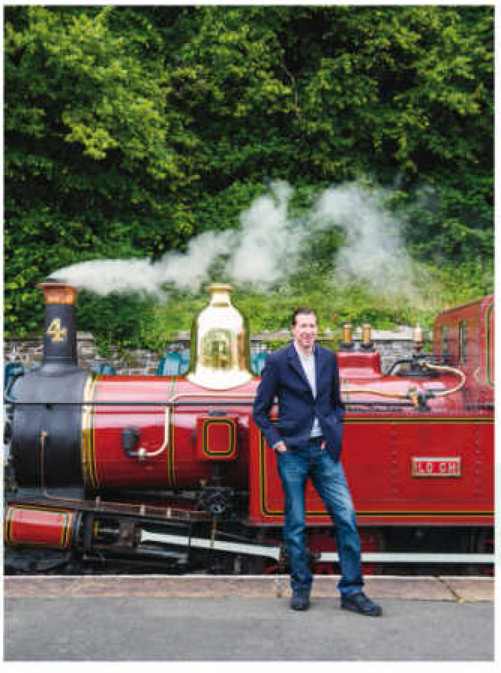
underpin them are already based here—and that number is growing steadily.

As our S-Class glides toward Douglas, the island's capital, passing green hills speckled with sheep, Perren explains that her car service caters exactly to this crowd of cryptocurrency entrepreneurs and bitcoin enthusiasts. Many of these newcomers (or "comeovers" as Manx natives term them) are young programmers and tech-savvy professionals from the U.S., Canada, and Brazil who first arrived for jobs in online gambling. During the past decade, some of the world's biggest such companies have relocated here—including Rational Group, which owns the websites PokerStars and Full Tilt Poker—making the island as important to online poker as Las Vegas and Macau are to bricks-and-mortar casinos. Perhaps unwittingly, they've also played midwife to the island's cryptocurrency community. Although most online gaming companies won't accept bitcoins, the digital currency is popular among the island's tech set, and some devotees have traded their jobs for startups dedicated to digital currencies.

Nick Williamson, a tousle-haired American who dropped out of Illinois Institute of Technology to play professional poker, is one of them. In 2011, PokerStars lured Williamson here with a job managing its nontournament cash games. "As long as you can find a chance to get off the rock from time to time so you don't get cabin fever, it's great," says the 29-year-old Midwesterner. His lapel pin implies even more enthusiasm for his adopted home; it's the Isle of Man's triskelion, a vaguely creepy heraldic symbol of three disembodied, armored legs.

Williamson became interested in bitcoin for its potential to revolutionize online poker, perhaps one day eliminating the need for a neutral party to administer the game and verify players' stakes. After moving to the island and messing around with the bitcoin source code in his spare time, he started writing his own blockchain protocol. (See page 46 for more on the blockchain.) In November 2014, he left PokerStars to focus on Pythia, a Manx startup he founded that provides off-the-shelf





Opposite: **Brian Donegan**, top, spearheads the government's cryptocurrency efforts; while the island is better known for its steam locomotives, the **Manx Electric Railway** also operates a 17-mile line from Douglas to Ramsey. This page, from top: **St Mary's Isle** in Douglas Bay, which once offered refuge to shipwrecked sailors; **Charlie Woolnough**, at the Douglas railway station, helped found CoinCorner, a bitcoin exchange.

software customers can use to create and run their own customized blockchains.

To prove the feasibility of Pythia's protocol, Williamson found an unusual partner: the Isle of Man's government. The government is creating a register of the island's cryptocurrency companies—and, as a pilot project, that register will itself be stored on a blockchain created using Pythia's protocol. This will make the Isle of Man the first government anywhere to use a blockchain to store official data, Williamson says.

"It just demonstrates our bona fides," Brian Donegan, an official who helps spearhead the island's pitch to cryptocurrency businesses for the Department of Economic Development, says of the blockchain pilot. "But it also signals that we have a balance between the importance of regulation and being open for business."

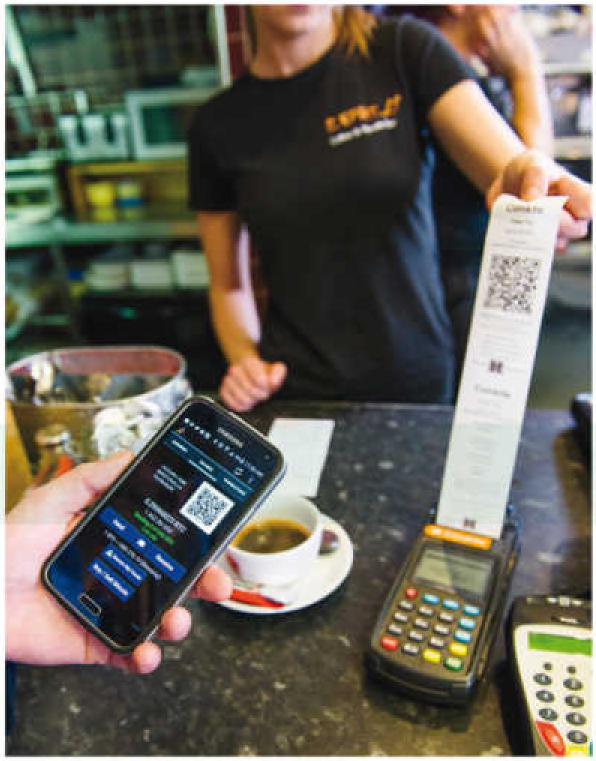
The way Donegan sees it, while the U.K. dithered next door, publishing hand-wringing white papers about how to approach bitcoin, the Manx government plowed ahead. In less than a year, it created a regulatory framework and passed legal changes through the Isle of Man's parliament, the Tynwald, which dates back more than 1,000 years and claims to be the world's oldest continuously operating legislature.

Cryptocurrency exchanges must now abide by the island's anti-money-laundering and know-your-customer requirements, with the Isle of Man's financial regulator enforcing compliance. "To keep crime out and protect the consumer is our absolute priority," Donegan says.

Eric Hollreiser, communications director of Rational Group, says he sees parallels between the government's creation of a regulatory regime for online gaming a decade ago, which helped legitimize the entire sector, and what's happening today with bitcoin, which also has a Wild West reputation. "That was the tipping point in our decision to locate here," the Los Angeles expat says of the e-gaming regulations.

There's more for fintech entrepreneurs to like about the Isle of Man than its regulatory regime. The three fiber-optic rings that connect the island to Ireland and the U.K. provide unusually powerful bandwidth. Electricity is plentiful and reliable—as are the island's ultrasecure, resilient data centers. And then there's the island's tax structure: no corporate tax; no capital gains or dividend taxes; and low rates of personal taxation, topping off at 20 percent, less than half the highest rate in the U.K.

The Isle of Man's swift acceptance of digital currencies comes at a time when the protectorate is under increased scrutiny from the U.K. and other governments for its status as an offshore tax haven. The island—which has enjoyed three decades of continuous economic expansion and has a history of embracing emerging technological innovations, such as satellites and cellular service—is also seeking to further diversify its economy, and e-commerce (which includes online gaming) already accounts for more than 20 percent of the



Clockwise from top left: A customer pays for coffee with bitcoins at **Java Express**; **Adrian Forbes**, who runs the startup TGBEX, sits next to a statue of actor Norman Wisdom, who retired to the island; Forbes's TGBEX sells **tokens** engraved with a bitcoin private key; the cryptocurrency community congregates at **The Thirsty Pigeon**, where bitcoins buy **pints**.

Isle of Man's £4 billion ($6.2 billion) annual gross domestic product. (Financial services account for about 35 percent of GDP, while other professional services—including law and accounting—make up about 20 percent.) The Manx government wants to avoid the fate of Jersey, another British protectorate and offshore financial center, which faces a potential £125 million budget shortfall by 2019, in part because the U.K. has cracked down on tax avoidance strategies that rely on offshore funds.

But doesn't regulation undermine the whole point of bitcoin, which was founded on the libertarian promise of unshackling money from government oversight? It's a question Charlie Woolnough hears often. The Manx native helped set up CoinCorner, a bitcoin exchange, on the island in 2014 as well as the Manx Digital Currency Association, which represents the island's nascent cryptocurrency community in discussions with the government and regulator.

Woolnough says submitting to "an intelligent regulatory regime" is the only way bitcoin will gain widespread acceptance. "Otherwise, bitcoin could become just the plaything of the dark Web," he says, referring to the constellation of illicit Internet sites run by anonymous servers. A lanky 39-year old, Woolnough spent a decade working in the hedge fund industry in London before returning to the island in 2013 because he felt it offered his family a better quality of life. Since coming back, he's become a bitcoin guru, educating many islanders about the cryptocurrency. Of the few Manx retailers that accept bitcoins, most have begun doing so after Woolnough helped connect them to CoinCorner.

Not that the digital currency is exactly ubiquitous yet. My Lady Chauffeurs taxi ride; a couple of cappuccinos at Java Express, a Douglas cafe; and a few pints of Manx-brewed Okells at Douglas's Thirsty Pigeon pub were the only things I managed to actually buy with bitcoin during three days on the island.

As Woolnough tucks in to a lunch of locally caught hake at The Little Fish Café, a forest of sailboat masts swaying in Douglas's

North Quay behind him, he says he hopes that bitcoin becoming a regulated industry on the isle will also unlock access to mainstream Western European banks. CoinCorner, like most European bitcoin exchanges and digital-wallet providers, has an account with a small Eastern European bank, which deters some customers and business partners who would prefer the added comfort of dealing with a bank whose brand they recognize and respect.

The new regulations divide the Isle of Man's burgeoning bitcoin fraternity. "You can buy a Rolex or diamonds without going through an extensive know-your-customer process, and these things are much less traceable than bitcoin," says Isle native Adrian Forbes. The founder of TGBEX, Forbes sells physical bitcoins or—rather, as his lawyer always reminds him to clarify, lest he be classified as a foreign-exchange operator—"decorative, metal novelty tokens." Each token is engraved with a bitcoin private key that enables a purchaser to transfer a set amount of the currency to a digital wallet. Forbes does the engraving himself in a tiny office decorated with CrypArt lithographs that incorporate QR codes for bitcoin digital wallets. A bitcoin true believer, he sees the digital currency as a step toward a better world: "It's a global currency that can't be manipulated by any government, can't be devalued on a whim," he says. "You have these debt crises going on; these things couldn't happen if everyone used bitcoin."

Forbes grew up on the Isle of Man but left to work in financial services in the U.K. and Ireland before returning in 2013. Being on such a small island has big benefits, he says. "You can meet people at the very top of government, they will listen to you, and you can get things done quickly," he says.

Unlike locals Forbes and Woolnough, Gareth Jenkins, a 35-year-old British programmer and computer game developer, first set foot on the Isle of Man in September 2014 for Crypto Valley Summit, an industry conference. He came to get exposure for his startup, EVA Plexus, which created a protocol for storing data on the bitcoin blockchain. Jenkins fell hard for the place; he went home to England, packed his bags, and moved here. "I like that Douglas is a small town that doesn't feel like a small town," he says from a perch in Noa Bake House, a hipster bakery, cafe, and flower shop near the town's waterfront.

Hipster bakeries, locally brewed beer, ultrafast broadband—the Isle of Man has everything a bitcoin hub needs, plus some seriously strange charm. BM

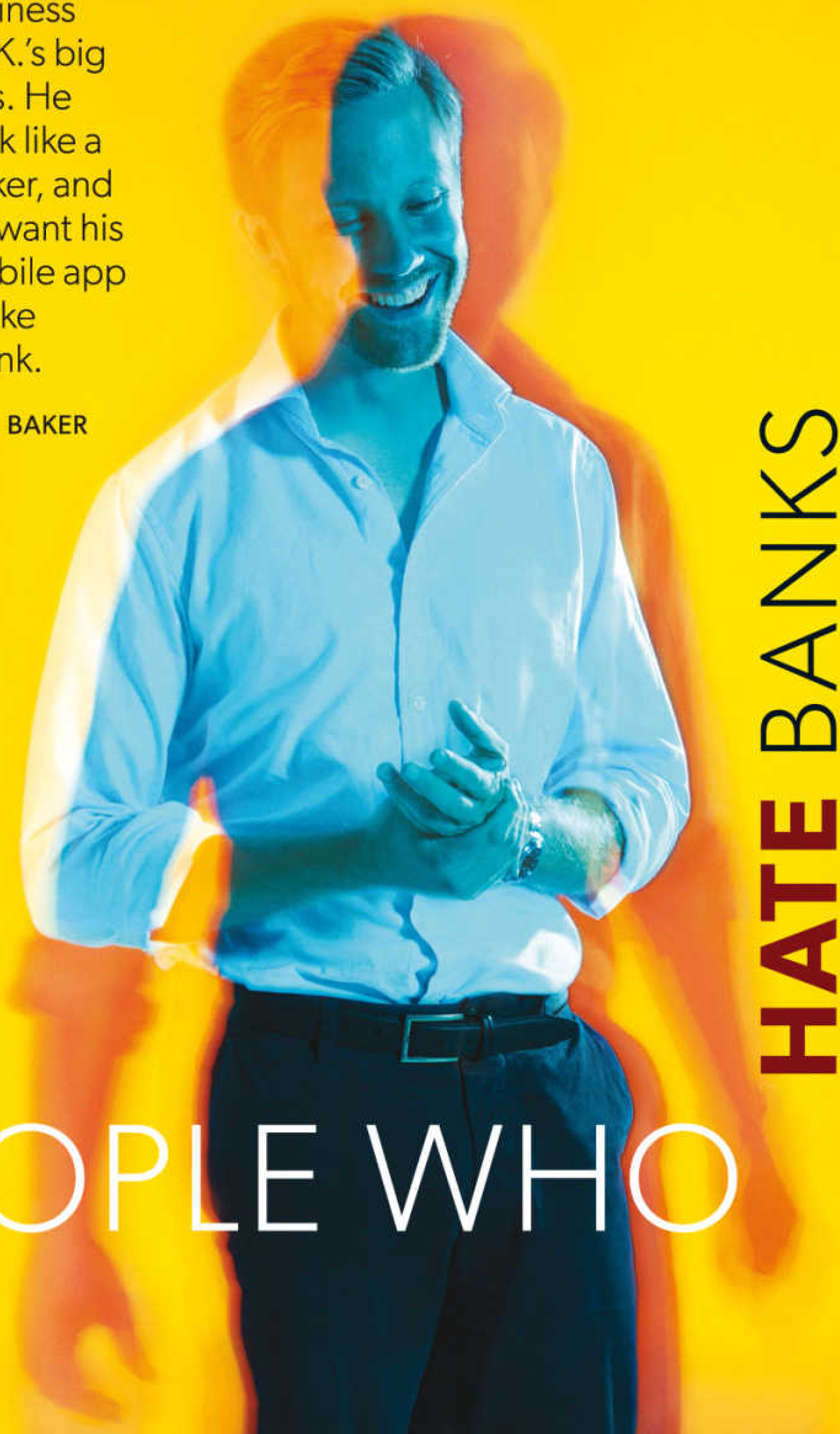
Gareth Jenkins, below, moved to the island shortly after attending an industry conference there in September 2014; a view of **Douglas**, the Isle's capital

BUILDING A BANK

PHOTOGRAPHS BY **SEBASTIAN PALMER**

Tom Blomfield wants to grab business from the U.K.'s big four lenders. He doesn't look like a typical banker, and he doesn't want his Mondo mobile app to behave like a typical bank.

BY STEPHANIE BAKER



FOR PEOPLE WHO HATE BANKS

O

ON A SWELTERING afternoon in July, Tom Blomfield emerges from the Bank of England offices in the heart of the City of London and promptly sheds his suit jacket. Blomfield, the 29-year-old, bearded CEO of Mondo, a startup smartphone bank that's applying to operate in the U.K., isn't the suit-wearing type. He's eager to get back to his Clerkenwell workspace for a beer to celebrate Mondo's surmounting a big hurdle in its quest for a banking license.

Blomfield and his team have just spent two hours getting grilled by eight regulators from the central bank and the Financial Conduct Authority. The officials quizzed them on how Mondo will attract customers and remain financially viable. After poring over Mondo's 250-page submission, which included details of its capital and liquidity plans, the group pressed Blomfield on why he wanted to run a bank. "They said he didn't look like a typical banker," recalls Mondo Chairman Denise Kingsmill, who, as a member of the House of Lords and a former deputy chairman of the U.K.'s Competition Commission, added a touch of gravitas to the presentation.

Blomfield had a ready retort: "I said I want to run a new type of bank."

When he's not trying to charm regulators, Blomfield shows the kind of passion—and irritation—it takes to build a bank from scratch. His catalog of complaints about big lenders is familiar to most consumers: hours of paperwork to open an account or apply for a loan, exorbitant fees for using your credit card abroad, onerous overdraft charges, and clunky mobile apps. "I wake up and say: 'My bank is so bad. These guys are dinosaurs!'" Blomfield says. "It impacts me, my family, all my friends. We all have to use banking, and it's broken."

Blomfield wants to make Mondo the Google or Facebook of banking with accounts that are as easy to use as e-mail. "We are targeting a demographic that values being able to do everything over a mobile phone in five seconds," he says.

If Blomfield and Kingsmill get their way, Mondo won't be just another snazzy app using the license of an existing bank. That's been done in the U.S. by Simple.com, which piggybacks onto Bancorp Bank, and in Germany by Number26, which is bolted to Wirecard Bank. Unlike other startups, Mondo has built proprietary software. If Mondo gets a license from the BOE's Prudential Regulation Authority, it could—as early as next year—begin taking deposits and lending money.

Should Mondo pass muster, it might thank Chancellor of the Exchequer George Osborne. He's overseen the regulatory revamp that's made it easier for startup banks to get off the ground. In a speech last year at Canary Wharf tech accelerator Level39, Osborne said he wanted to make London the "fintech capital of the world." In March, he said the Bank of England should grant at least 15 new licenses in the next five years.

"Osborne is a real tech geek," says Rohan Silva, a former technology adviser at 10 Downing Street, pointing out that the chancellor learned to code as a teenager. "Investors and entrepreneurs haven't started new banks in this country because they knew the regulators wouldn't let them," he says. "We thought if we took away regulatory barriers, fintech would explode."

When it comes to British banking, such innovation looks long overdue. The big four

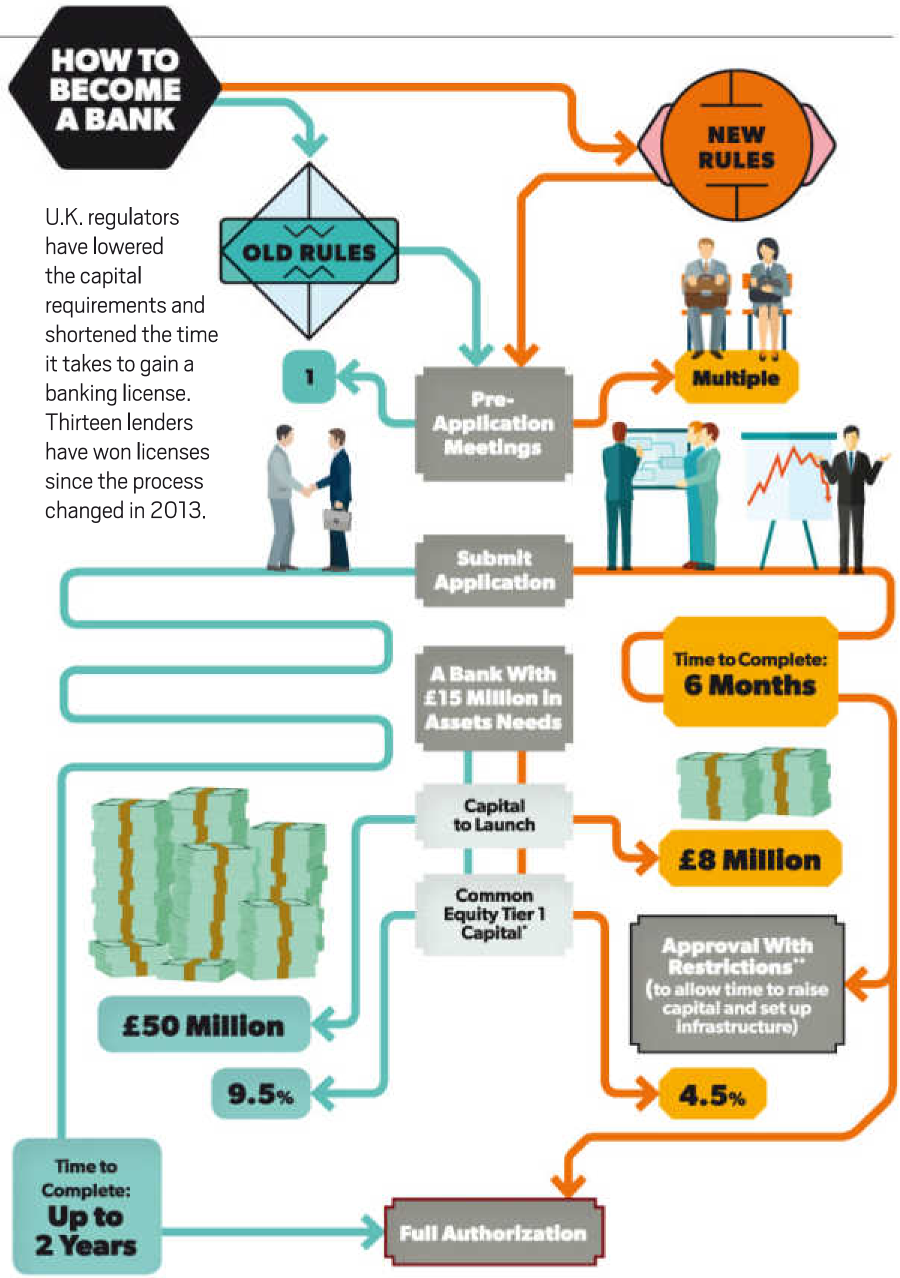
Mondo Chairman **Denise Kingsmill** recalls how regulators reacted to Blomfield: 'They said he didn't look like a typical banker.'

banks—Barclays, HSBC Holdings, Royal Bank of Scotland Group, and Lloyds Banking Group—control 77 percent of the U.K.'s 65 million personal checking accounts. Customers aren't overwhelmingly happy with the available choices. Only 60 percent say they're satisfied with their bank, a 2014 survey from consulting firm Accenture found.

It used to be exceedingly difficult to start a bank in the U.K. The process took years and required millions of pounds in upfront capital, without any indication whether regulators would give their seal of approval. When a bricks-and-mortar lender called Metro Bank opened its doors in 2010, it was the first new retail bank U.K. regulators had authorized in 100 years—and it took them almost two years to OK it. Today, Metro has more than 500,000 customers, and deposits surged 188 percent to £2.9 billion ($4.5 billion) last year. While Metro's branches are open seven days a week and feature amenities such as water bowls for dogs, the bank began offering a mobile app only last year.

The application process is now simpler—for both physical banks like Metro and digital ones like Mondo. Under BOE and FCA rules, a new entrant can hold as little as £1 million in capital initially. An applicant needs common equity Tier 1 capital of 4.5 percent of risk-weighted assets, significantly less than the 9.5 percent required under the old rules that still apply to existing banks. The Bank of England says it will use its discretion to give startups more time than before to build the additional capital required under Basel III. "Regulators here are much more progressive and open than in the U.S.," says Eileen Burbidge, an American who's a partner at Passion Capital, the London venture firm that in April gave Mondo $2 million in seed money. "If you're doing leading-edge fintech, London is the place to be."

Indeed, investment in fintech companies is growing faster in the U.K. than it is anywhere else in the world. Last year, London's fintech startups attracted £343 million, triple the amount invested in the previous year, according to London & Partners, a firm set up by London Mayor Boris Johnson to promote the city. U.K. fintech companies raised £306 million in the first



**Firms must also hold capital buffer. **Firms required to meet the same capital requirements as incumbent banks five years after they start business. Sources: Bank of England, Bloomberg*

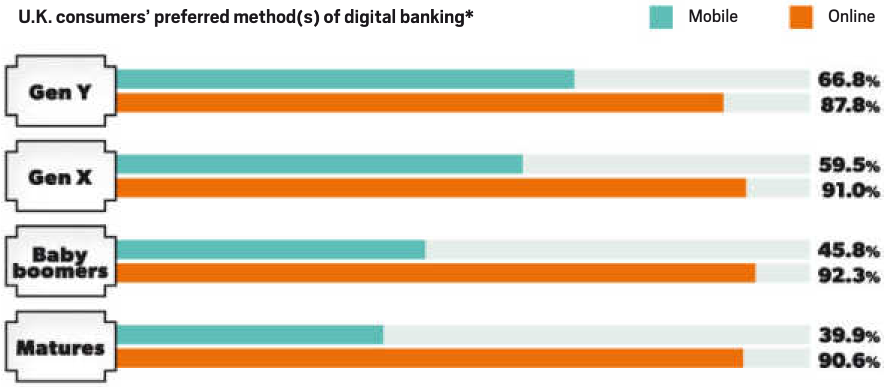
half of 2015 alone. With venture capital red-hot for fintech, Mondo's goal to attract a further $15 million to begin operating as a bank looks modest. The sum would cover additional hiring and marketing as well as initial capital to back any lending losses.

More banks are getting the green light—and getting it faster. Thirteen have won licenses since the regulatory changes in 2013. In June, Atom Bank became the U.K.'s first digital-only lender to secure approval, just six months after it formally applied. It expects to begin opening accounts next year, focusing on its mobile app to target small and medium-sized businesses and consumers.

Atom likely will beat Mondo to the market. It has attracted £25 million in financing from such big names as Jim O'Neill, the former Goldman Sachs economist who's now the U.K. Treasury's commercial secretary, and venture capitalist Jon Moulton. "It's in everyone's interest to digitize as much of the customer experience as you can because it costs less," says Mark Mullen, Atom's CEO, who ran First Direct, the

DIGITAL DIVIDE

The younger you are, the more likely you are to do your digital banking on your phone.



**Percentage of respondents who are 'currently using' or 'considering using' online or mobile banking services. Source: PwC*

telephone bank set up by HSBC in 1989. Atom hasn't revealed details of its mobile app. Mullen says only that he hopes to use biometric security and locational data to enrich the offering.

In contrast, Mondo is an open book. It's in the process of rolling out a prototype app and prepaid MasterCard to a few hundred people initially to get feedback on which parts are popular and which aren't. "We don't want to be building a bank behind closed doors," Blomfield says. "The real value is not in the ideas but in the execution."

Blomfield's time at Silicon Valley incubator Y Combinator in 2011 shapes his approach, so much so that he sometimes dons a T-shirt with the Y Combinator motto: "Make Something People Want." Blomfield earned a law degree at the University of Oxford. A few years later, he teamed up with two fellow Oxford grads to build GoCardless, a simplified system for companies to accept recurring payments. Today, it's used by the *Guardian* to collect subscriptions and the U.K. government for road taxes. Blomfield still has a stake in GoCardless, which processes $1 billion of transactions a year.

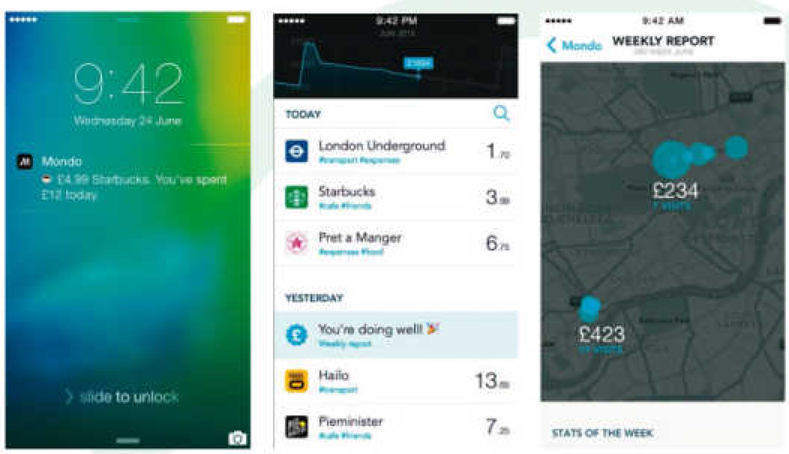
Once GoCardless was up and running, Blomfield set his sights on banking for consumers. He joined with experienced bankers to get Mondo off the ground. The chief risk officer is Paul Rippon, the former head of operations at Allied Irish Bank; the chief financial officer is Gary Dolman, the former CFO of Japan's Mizuho International.

While technology has changed every aspect of our lives, Blomfield says consumer banking has remained frozen in time. Banks continue to offer customers a static list of deposits and withdrawals rather than providing timely updates or useful tools to analyze spending or saving. In a world of instant messaging, many lenders don't communicate in real time. Blomfield's current bank (which he declines to name) took two weeks to alert him he'd overdrawn his account by £800 and then charged him £20. "The banks have their hands in your pockets constantly, taking money out," he says.

The Mondo app is designed to tell you if you mess up. It lets you set up real-time notifications that say how much you've spent daily or whether you're going into overdraft. If you need £500 to tide you over to payday, Mondo will tell you how much it will cost for a short-term loan instead of charging you after the fact.

Pulling out his phone, Jason Bates, Mondo's 43-year-old co-founder and chief customer officer, shows his Mondo prototype app. He'd just had a burger with his wife at Five Guys in Soho, which turned up immediately on his account with a map of where he'd used his Mondo card. With a swipe, he demonstrates how you can turn off the card if you lose your wallet and immediately

'My grandmother would not use this bank,'
Blomfield says of Mondo.
'But a big segment of the population would.'



Mondo shows you what you're spending—and where. And it alerts you if you're getting into financial trouble.

turn it back on if you find it. You can even block your card at pubs to encourage a dry spell.

By tracking your regular bills, Mondo can alert you if something is out of the ordinary, like a utility charge that's higher than normal. This smarter use of data can help detect fraud, Bates says. "We see your phone is in Manchester but your card was being used in London," he says. "We can block your card and send you a text saying: 'Something is fishy. Can you confirm?'"

Blomfield and Bates say Mondo could charge much lower fees and still become profitable because its cost base is a fraction of what major banks shoulder. Old-style lenders are saddled with the expenses of maintaining branches and updating antiquated IT systems. Back-end computer systems that process transactions can date to the 1970s and have had meltdowns, says David Parker, a financial services consultant at Accenture in London and former director of operations at Barclays Capital. Last year, British regulators fined RBS £56 million for a computer failure in 2012 that left 6.5 million customers without access to their accounts for weeks after a contractor updated software. "It's difficult to build an app that's fantastic when you have an ugly core banking system," Parker says. "The banks have to change quickly or they run the risk their customers will desert them." Philip Hampton, who was then RBS's chairman, said the problems "revealed unacceptable weaknesses in our systems."

Not everyone is convinced tech-savvy banks will lure enough customers from the big four to become major players. New fintech banks may have a hard time attracting more than just "hardcore money geeks," says James Moed, a consultant to fintech startups and a former director of IDEO, a London-based financial services designer. "Most people find managing their money boring and regard banking as a utility," Moed says. "I'm not sure great apps will motivate people enough to switch."

Generation Y, the so-called millennials, born from the 1980s to the early 2000s, may be the most fertile hunting ground. Almost 67 percent prefer mobile apps for banking, compared with 46 percent of baby boomers, aged 51 to 69, according to PricewaterhouseCoopers. A study by Viacom's Scratch research unit called "Sorry Banks, Millennials Hate You" found 71 percent of 18- to 34-year-olds would rather go to the dentist than listen to what their bank says.

Blomfield acknowledges that Mondo isn't for everyone. "My grandmother would not use this bank," he says. "But a big segment of the population would."

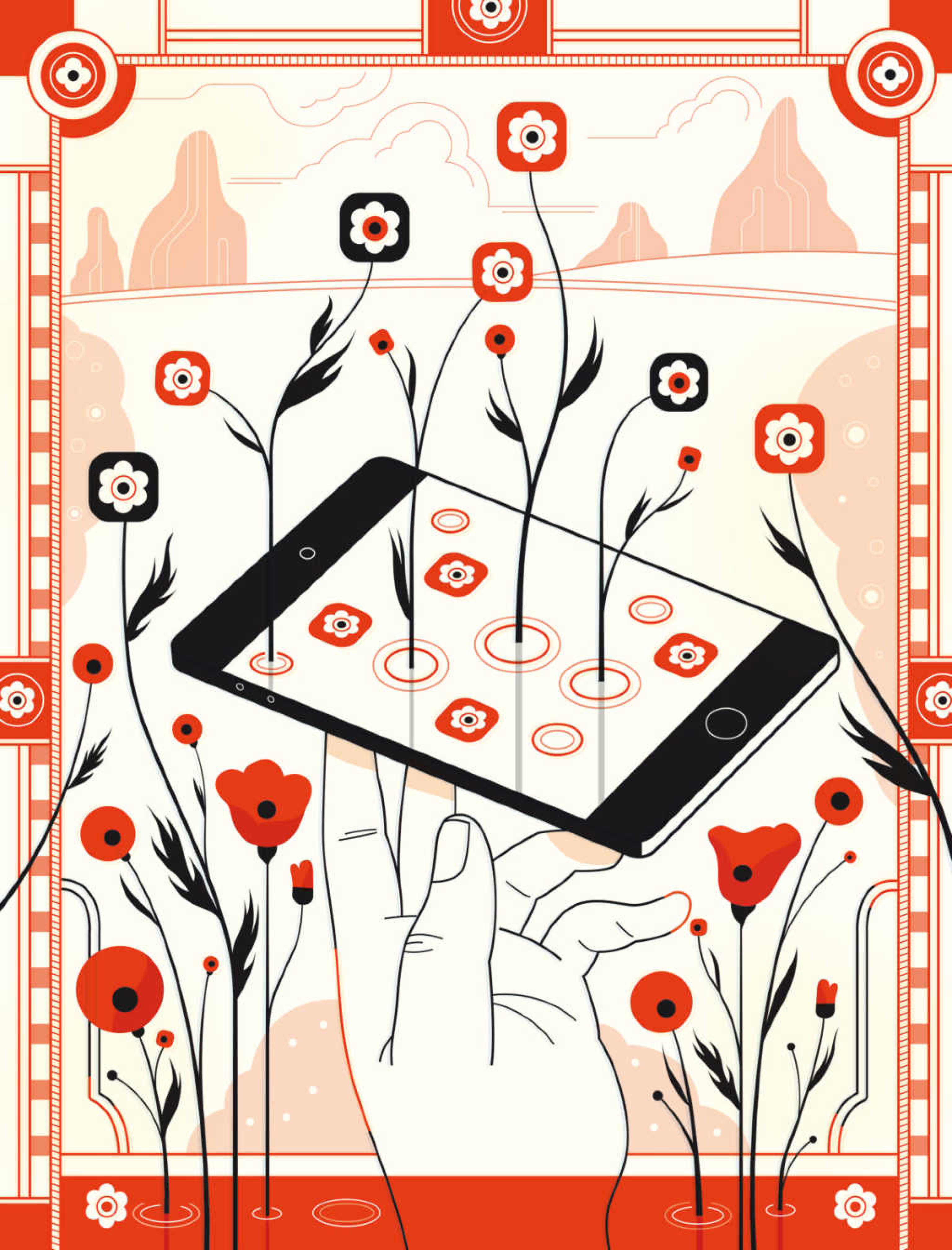
He likens the banking behemoths to Blockbuster Video, while digital startups such as Mondo are like Netflix. With the right technology and open-minded regulation, Blomfield says, even as staid and entrenched an industry as retail banking can be disrupted. "We think," says the guy who doesn't look like a typical banker, "there will be a generational shift in how banking works." BM

BLOOMBERG TIPS

Tracking Mondo on Twitter

You can use the Twitter Filter Builder (TWTR) function to set an alert that will notify you of tweets relating to Mondo. Type **TWTR <Go>** on the Bloomberg Professional service. The mobile banking startup's Twitter handle is @getmondo, so enter *GETMONDO* in the field and click on the getmondo Twitter Feed item. To set an alert, click on the Display & Edit button on the red tool bar and select Set Alert Delivery. In the Delivery Options window that appears, click on Deliver to Alert Catcher and then on Bring Catcher to Front, for example, to send the notification to your Bloomberg Alert Catcher, a tool that consolidates all of your alerts. Click on the Done button. JON ASMUNDSSON

'If you're doing leading-edge fintech, London is the place to be,' says **Eileen Burbidge**, a partner at Passion Capital, which gave Mondo $2 million in seed money.



LET A HUNDRED APPS BLOSSOM

THE CHINESE ARE SKIPPING STRAIGHT FROM CASH TO DIGITAL FINANCE.

BY SHAI OSTER

ILLUSTRATION BY **HARRY CAMPBELL**

You forgot your wallet, and it's four flights up to your apartment in Shanghai's French Concession. No worries. You've got your smartphone. Open Tencent Holdings' WeChat, the Chinese Twitter on steroids, and tap China's versions of PayPal, E*Trade, TripAdvisor, Amazon, and Uber rolled into a single app. Order and pay for your taxi and then book a restaurant where you'll split the bill electronically with a friend. With a few minutes to spare, transfer money into the mutual fund run by e-commerce giant Alibaba Group Holding. See a poster for a hot new movie? Snap a photo of it and let search engine Baidu find a theater and buy you tickets for later that evening.

Financial innovation is bubbling up around the globe, but China is where digital banking, investing, and lending have gone mainstream. Technology companies armed with financial apps are challenging banks and other intermediaries for a market with 1.3 billion people and $7.8 trillion of deposits. Tencent's WeChat (called Weixin in Chinese), Alibaba's Alipay arm, and Baidu are leading the way with digital wallets that let consumers manage their money via their phones. "Financial innovation is being discussed everywhere—in New York, London, San Francisco, Hong Kong," says Zennon Kapron, managing director of Shanghai-based consulting firm Kapronasia. "But mainland China is where it has gone beyond talk and is really having an impact. What we're seeing here is the future of global banking."

Traditional banking in China is balky, backward, and inefficient—creating ample opportunities for nimble tech companies such as Alibaba and Baidu. The huge, state-owned banks do some lending to consumers and private businesses, but they typically prefer making loans to state-owned enterprises that provide implicit government guarantees. For consumers, the government banks offer low interest rates on savings accounts, making new online funds and financial products with higher rates attractive. Banking can be such a struggle in China that consumers tend to shun personal checks and instead tote wallets bulging with 100 yuan ($16) bills, China's biggest banknote. "The inefficiencies of Chinese state-owned banks explain the innovation coming from the private sector," says Duncan Clark, a former Morgan Stanley investment banker who founded and runs BDA China, a Beijing-based technology consulting firm.

Kapron, who has lived in Shanghai for 11 years, has experienced the digital revolution firsthand. "In 2004, whenever I had to pay my rent, I would go to my bank, queue, withdraw my rent as cash, walk it across the street to my landlord's bank, take a number and queue, and then eventually deposit the money into his account," he says. "Today, I pay my rent using Alipay from Alibaba. I invest using WeChat from Tencent, and I bought a mutual fund from Baidu. The landscape has completely changed."

'What we're seeing here is the future of global banking,' says Zennon Kapron of Shanghai-based consulting firm Kapronasia.

Kapron is among the 390 million people in China who have registered to use mobile banking. That's more than the population of the U.S. and 40 percent of the people worldwide who bank by phone, according to consulting firm Accenture. Chinese companies that process online payments have lured even more converts. Alipay has attracted 400 million people worldwide who actively use the payment system on their desktops and mobile devices, the company said in July. It processed $778 billion of payments in the year that ended in June 2014.

Tencent's QQ messaging service counts more than 815 million active users each month. Tencent says more than 100 million users have integrated their bank cards with its QQ wallet and Weixin Payment services. In contrast, PayPal, one of the first online payment systems, had 165 million users worldwide in the latest quarter. Internet-based peer-to-peer lenders, meantime, made at least $32.5 billion in loans in China last year, almost quadruple such lending in the rest of the world, according to U.K. investment bank Liberum Capital.

China's big banks are fighting back. Industrial & Commercial Bank of China, the world's largest lender by assets, launched its own e-commerce website in January 2014 to sell jewelry, electronics, and other retail goods along with some banking products. It also offers a mobile app. Today, ICBC is No. 3 in sales volume behind Alibaba's Tmall and shopping site JD.com. Chairman Jiang Jianqing says it took ICBC 204 days to hit 10

BLOOMBERG TIPS

The Chatter About WeChat

You can use the Peer Barometer (IRPB) function to compare Tencent, the developer of WeChat, with peer companies. Type **700 HK <Equity> IRPB <Go>** on the Bloomberg Professional service. Click on the Markets tab to track trading. To view news sentiment, developments, and recent headlines, click on the Developments tab. For a high-level visualization of Tencent's market and industry relationships, type **RMAP <Go>**. Type **SPLC <Go>** to map its supply chain. For Bloomberg Intelligence research on mobile payments, type **BI ETEC <Go>** for the Emerging Technologies Dashboard and click on Payments under Featured Topics. For BI research on China, type **BI CHINA <Go>**.

JON ASMUNDSSON

WeChat's **mobile wallet** lets users transfer money between friends, pay utility bills, link to e-commerce site JD.com, and participate in a wealth management fund called Li Cai Tong. It also shows how much money you have left to spend.

billion yuan, far less time than the seven-year average for a startup to reach that volume.

The old-guard banks themselves say they can't act quickly enough. Singapore-based DBS Group Holdings, Southeast Asia's largest lender by assets, is already active in China. It sees a new opportunity from the explosive growth of online banking and is building an incubator in Hong Kong to find and develop finance startups. "An insidious consequence of the 2008-to-2009 global financial crisis is that our industry has been so preoccupied with issues of capital, liquidity, and ethical conduct that we've been unable to prepare adequately for the digital future," says DBS CEO Piyush Gupta. "This has allowed nonbank competitors to make some of the biggest inroads into financial services."

Western financial institutions want to find out how China's digital leaders have built entire ecosystems around their users, says Albert Chan, Accenture's Beijing-based managing director. Tencent, Alibaba, and others deliver scale that's unimaginable—and deeply coveted—outside of China. "When I describe the numbers, jaws hit the floor," Chan says.

'Checks are so outdated, so few people use them,' says textile business owner Song Fuqiang. 'I don't bring money when I go out. I use Alipay to pay for everything.'

China's fintech arena has its own set of risks. Alibaba is investing in Jerusalem Venture Partners, an Israeli venture capital firm that runs a cybersecurity incubator, to work with startups and protect its payment business from hackers. Peer-to-peer financing is crowded with more than 1,500 lenders, not all of them sound. Yingcan Group, which tracks the nation's lending platforms, found that 275 peer-to-peer lenders went bankrupt or had trouble repaying money last year.

China's yuan recorded its steepest two-day fall in 21 years after the People's Bank of China said on Aug. 11 it will allow markets a greater role in setting the currency's value.

Mobile and Internet banks have a major weakness: Clients need an account at a bricks-and-mortar lender because a human teller must verify their identity. Alibaba affiliate Zhejiang Ant Small & Micro Financial Services Group is teaming up with a startup called Megvii to work around that rule. Megvii offers facial-recognition software based on the 1.3 billion scans China's public security bureau holds. These scans could potentially be used to identify online banking customers, Megvii says.

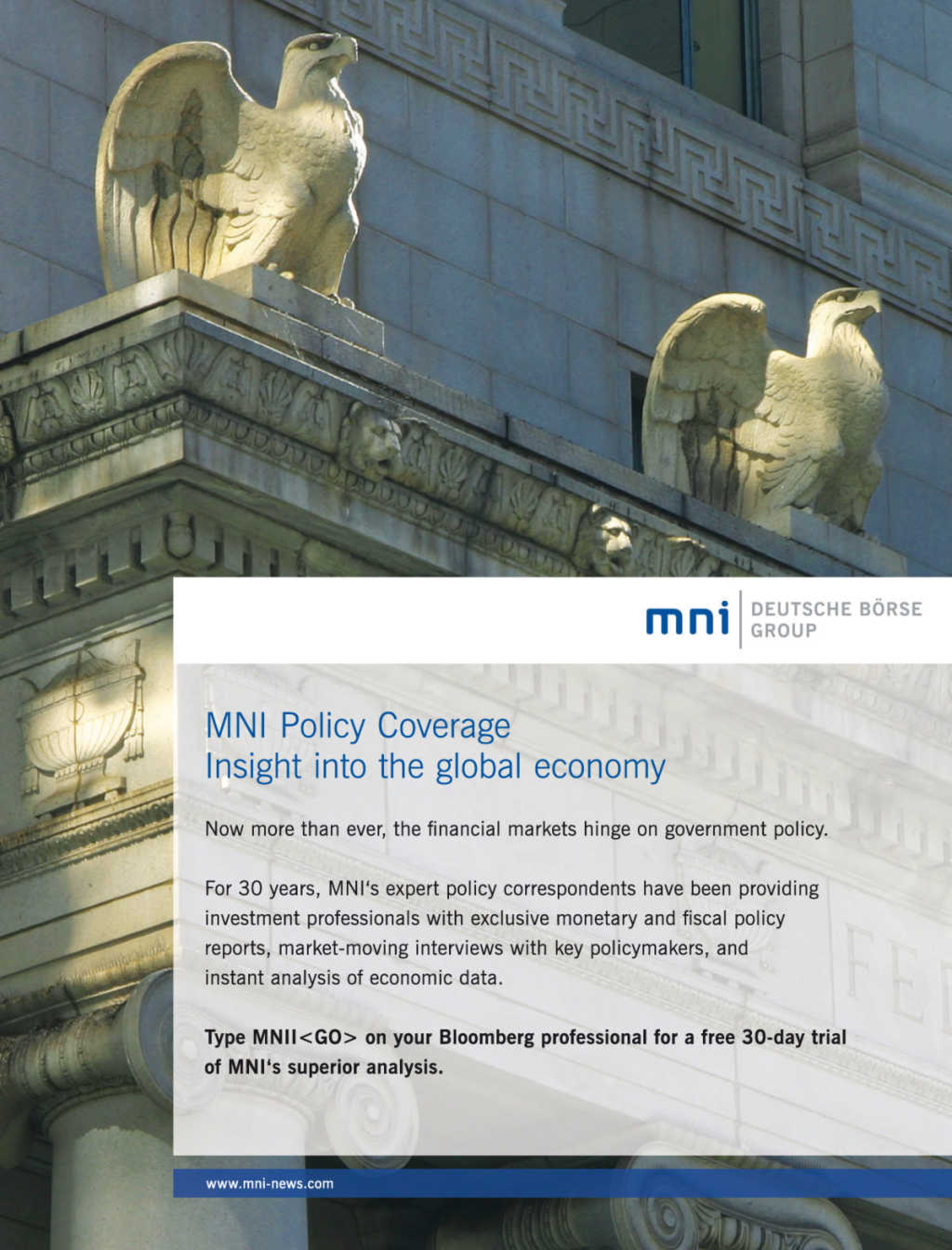
Regulators have indicated they're open to innovation. For one thing, digital banking leaves a trail that cash doesn't. And it might help the Chinese government get a clearer snapshot of economic activity.

In China, financial innovation can happen as a matter of necessity. When Jack Ma started Alibaba.com in 1999, the infrastructure for online payments didn't exist. Alibaba invented Alipay to overcome skepticism about doing business online with strangers by putting payments into escrow accounts until both sides are satisfied.

Song Fuqiang, who lives about 370 kilometers (230 miles) from Beijing in Hebei province, owns a textile business and uses Alipay every day. The 31-year-old has even put about 40,000 yuan into Alibaba's money market fund, Yu'E Bao. "Checks are so outdated, so few people use them," he says. "I don't bring money when I go out. I use Alipay to pay for everything."

Consultant Kapron marvels at how China's fintech revolutionaries have upended the cautious approach favored by Deng Xiaoping, the leader who began opening China's economy in 1978. "Instead of crossing the river by feeling the stones, they've built a high-speed train," he says. BM

With assistance from **Lulu Yilun Chen**, **Alfred Liu**, **Jun Luo**, and **William Mellor**.


mni DEUTSCHE BÖRSE GROUP
MNI Policy Coverage
Insight into the global economy
Now more than ever, the financial markets hinge on government policy.
For 30 years, MNI's expert policy correspondents have been providing investment professionals with exclusive monetary and fiscal policy reports, market-moving interviews with key policymakers, and instant analysis of economic data.
Type MNII<GO> on your Bloomberg professional for a free 30-day trial of MNI's superior analysis.
www.mni-news.com

A GALLERY OF UPSTARTS

PSYCHING OUT BORROWERS

Scott Saunders is the CEO of Payoff, which uses behavioral science to help individuals refinance their debt.

BY TRACY ALLOWAY

Q: Why wade into refinancing debts?
A: The credit card companies and banks are perpetuating the cycle of debt. We're reinventing lending from the perspective of wealth management. We actually want people to pay off their loans, and we don't want them to get a second, third, or fourth loan from us. We want to help people cross the chasm from a borrower mentality to an investor mentality, and paying off high-interest-rate credit cards is the best investment they can make.

Q: What differentiates Payoff?
A: Our underwriting is like an interview process that helps us understand people's levels of intrinsic motivation to really pay off their debt. We try to establish their willingness to do so, which requires some heart on their part. We're also actively researching and building resources and tools to support motivated members who do not currently qualify for a loan.

Q: You've hired Dr. Galen Buckwalter, who's best known for his work at eHarmony. Why?
A: Galen helped develop the matching algorithms at eHarmony, which are responsible for 4 percent of U.S. marriages. We're using his expertise to bring psychology to finance. Our science is ultimately about behavior change and helping people make better financial decisions. This process of change begins with self-understanding, and we're using advanced psychometric assessments to understand people's mindsets—the goal being to improve how they approach their financial decisions. We've taken the hundreds of questions you might answer in a typical psychometric assessment and compressed them into a three-minute "gamified" online assessment that gauges your financial personality.

Q: How do those results play into your business model?
A: The psychology is not factored into our underwriting today, but there are three behavioral things we look at. First, historical credit performance; we get that from the credit bureaus. Second, cash flow; we have our own approach to understanding and evaluating that component. And finally, behavioral data; ideally, we get that through direct interaction with the consumer.

Q: What's your role in the fintech revolution, then?
It's really about using science to empower our members by partnering with them to help them make better decisions. We see evidence that our approach will result in lower costs for us to both engage new members and dramatically lower overall default rates. Our fundamental bet is that doing the right thing for our members will pay off for them and for us.

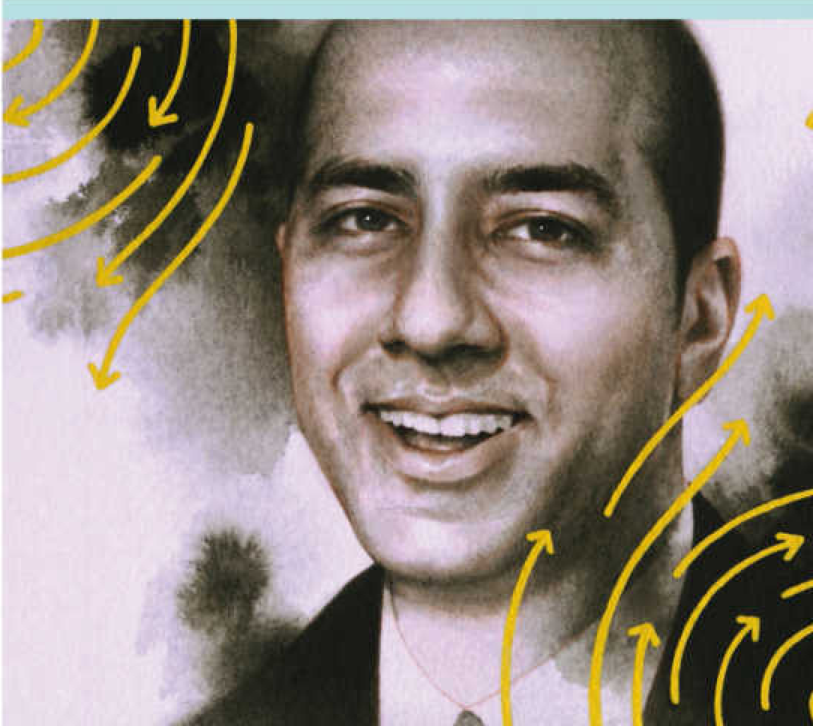


ILLUSTRATION BY **SIMON PRADES**

FINTECH FOR KIDS

Max Levchin, who co-founded PayPal, has a new company, Affirm, that helps millennials with loans for education and other big-ticket items.

BY NOAH BUHAYAR

Q: Why focus on lending to young people?

A: Millennials are the largest generation of Americans—almost 100 million people. And they're coming to a point in their collective lives when they're graduating college, landing well-paying jobs, and getting apartments.

Q: Why do you talk about transparency?

A: A lot of the financial products that people can have today, they're designed to be somewhere between confusing and entirely bamboozling. I think that's going to be drastically reduced. People will demand extreme clarity: "If I don't understand it, there is someone else who will offer me a clearer version."

Q: Where did your journey into the lending business begin?

A: I financed my first company with credit cards, much as my friends were doing. Having grown up in socialist Ukraine, I wasn't well educated in personal finance. When the company failed in 1996, I had something like $10,000 in debt.

Q: How dark did things get?

A: I ended up needing a root canal only to have the dentist refuse me because of my credit. I was hanging around Silicon Valley with this temporary filling, terrified of opening my mouth. I wound up in an emergency room because it got infected. I was the caboose of the American financial system.

Q: What did you take away from that experience?

A: After the PayPal IPO in 2002, I was perfectly fine financially and made all the efforts to clear my name and credit. It took almost a decade. The FICO score was popularized in the 1980s. The standardization and the push that took place back then was pretty awesome, but it's quite outdated.

Q: How so?

A: What used to be a slow ramp, where you had your first apprenticeship after college and very slowly gained your earning capacity ... the world just doesn't look like that anymore. People don't hold jobs for long. Their earning ability changes. They get vocational training through alternative learning platforms. Your financial and purchasing ability changes a lot faster than it used to, and your credit score should reflect that reality.

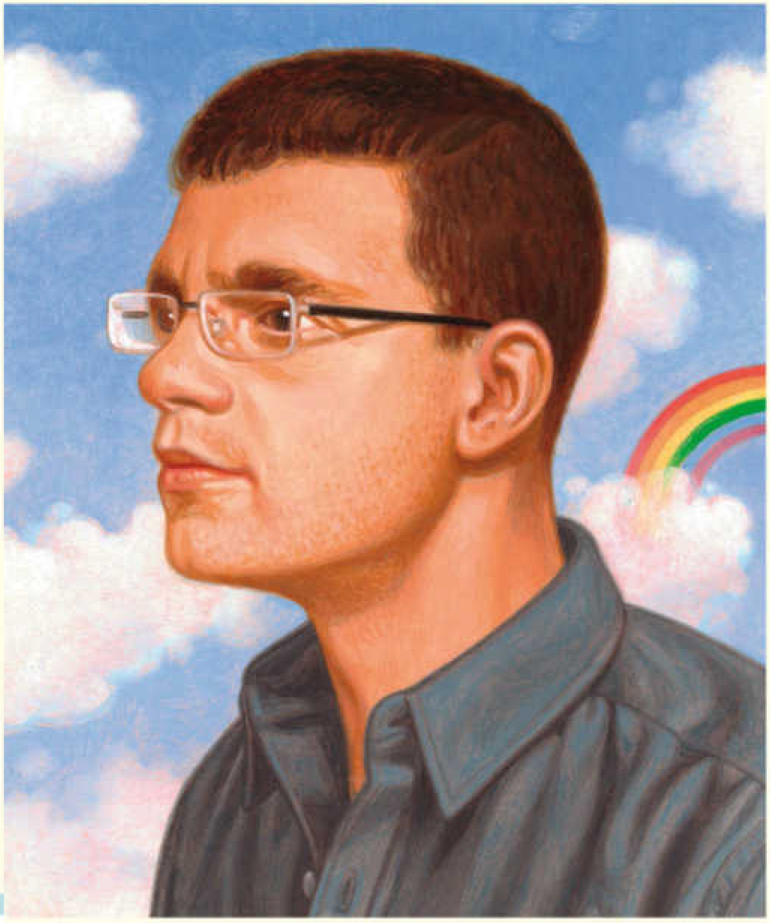


ILLUSTRATION BY **MARCO VENTURA**

GETTING A GRIP ON RISK

Ram Ahluwalia, CEO of PeerIQ, says peer-to-peer lending's biggest challenge is understanding and managing risk.

BY TRACY ALLOWAY

Q: What's the biggest challenge in P2P?

A: The current economic environment. There's a lot of capital chasing P2P loans that offer short duration and high yields in an otherwise low-interest-rate and low-default-rate environment. There's also no obligation for investors to fund loans; they can change their minds if their perceptions of risk and return change. P2P platforms need to ensure they have access to diverse and sticky sources of funding that won't suddenly disappear.

Q: What's next?

A: Consumer and small-business credit is transitioning to the capital markets, with bank regulatory requirements a key driver of this trend. As bank balance sheets shrink, institutional investors and

ILLUSTRATION BY **TRAN NGUYEN**

nonbanks are filling the gap. You are going to see dramatic growth in securitization and demand for risk management tools, like the ones we are building. I think you'll have a very robust asset-backed-security market that underpins the industry growth.

Q: What's so hard about managing risk?

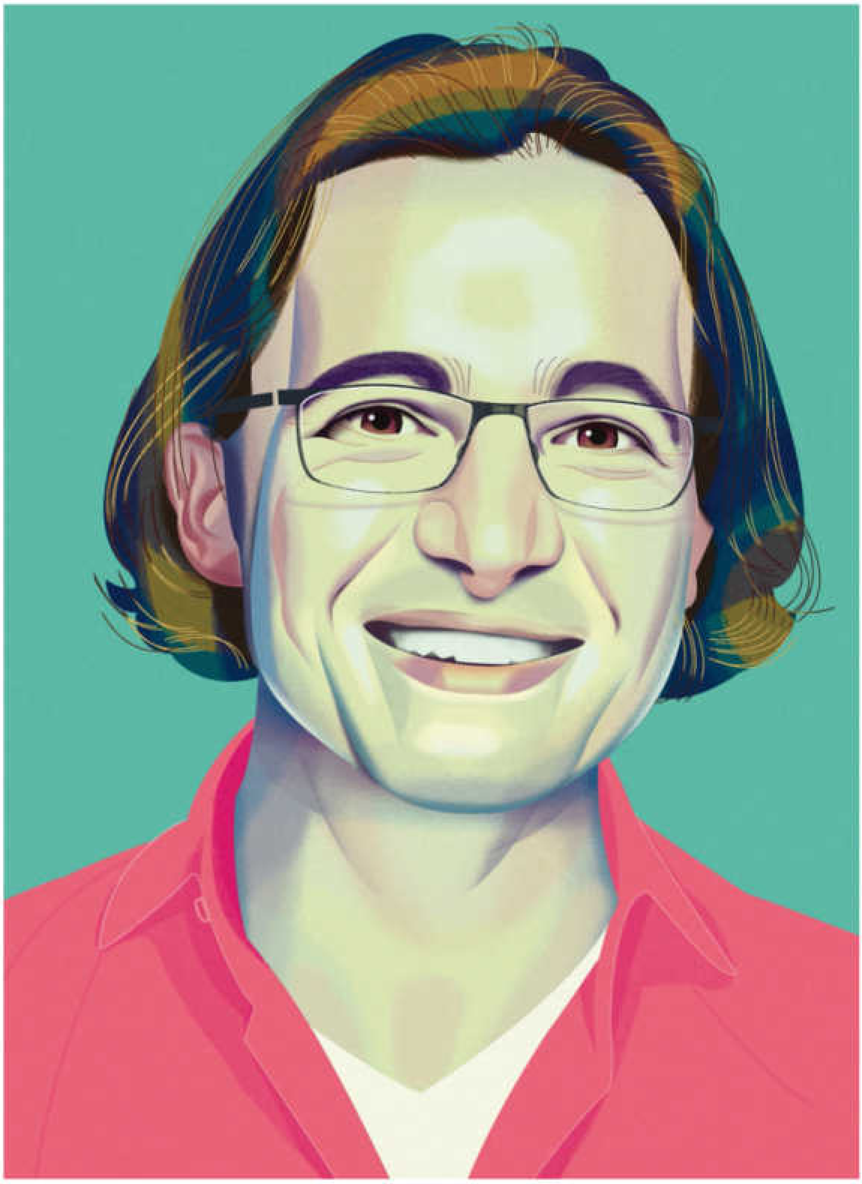
A: There is no standardized valuation methodology for P2P loans. There is no mark to market. Funds use different valuation approaches. Also, there are asset and liability mismatches. Hedge funds may own pools of P2P loans with three- or five-year duration yet only offer quarterly liquidity. These mismatches are exacerbated in a downturn, when redemptions tend to accelerate. PeerIQ allows clients to benchmark loan performance, manage portfolios, meet reporting requirements, and project cash flows across scenarios.

Q: What about derivatives?

A: Securitization and structured products go hand in hand. The tools we've built to help institutions understand their risk can be used to structure and price other financial products, such as insurance-wrapped P2P loans. Risk transfer instruments are something that clients ask about and will eventually be part of a robust risk management tool kit. Institutions and banks are more willing to fund P2P, potentially through a credit cycle, when they know they can manage their risk responsibly.

'IT'S ALL JUST DATA'

Eric Poirier, CEO of Addepar, a startup that provides wealth management software, aims to get banks beyond spreadsheets.



BY MARGARET COLLINS AND SIMONE FOXMAN

Q: How are you disrupting finance?

A: There are $120 trillion of assets being managed in the world. The most common infrastructure for managing those assets? Spreadsheets run by people. The technology just hasn't kept pace. At Addepar, we've built technology that gathers data describing all the assets in a given portfolio. It doesn't matter if you've got stocks and bonds, investments in private equity and hedge funds, or even art and wine. From our perspective, it's all just data.

Q: What's your biggest challenge?

A: There are no data standards across the banks; Fidelity, Schwab, Goldman, and JPMorgan will each represent data differently. We throw a lot of technology at that problem. Most banks have a massive "tech stack," many parts of which were built decades ago. The budgets associated with that are massive. But if you're running a wealth management group, your primary concern should be: *Is my team happy, healthy, and growing? Are the clients happy, healthy, and growing?*

Q: What's the secret weapon?

A: Amazon's Cloud is a big one. At the end of the day, these are just a bunch of servers in a building somewhere being managed by people, and they keep coming up with new tools for us. For instance, say you just need to run a quick calculation. We can now spin up a server for a second, do something, and then shut the server down—and you don't have to pay for it if it's off. So if I have a whole bunch of data coming in at a certain point in the day, I crunch that data and then shut the server off.

ILLUSTRATION BY **NIGEL BUCHANAN**

REAL ASSETS 2.0?

Free LiveINSIGHTS Web Conference

Thursday, September 10, 12:00 pm ET

Register at NYST <GO> or www.bloombergmarkets.com/liveinsights

Since the financial crisis, central bank policies have heavily influenced prices and correlations of most investments–including real assets such as oil, real estate, commodities, energy infrastructure, precious metals, and so forth. Now with investors starting to anticipate a return to markets more driven by fundamentals, what lies ahead for the asset class? Has the utility of real assets in building portfolios been changed by the years of generous monetary stimulus?

Join this Bloomberg Markets LiveINSIGHTS web conference to gain fresh perspectives on the benefits of Real Assets and why the current environment may be a good time to consider these investments for your portfolio.

SPEAKERS

ABDUR NIMERI, PH.D.
Senior Vice President,
Senior Investment Strategist
Northern Trust Asset Management
FlexShares

DONALD R. CHAMBERS, PH.D.
Associate Director of Programs
CAIA

TONY GLICKMAN
Senior Managing Director
and Chief Risk Strategist
RiskSpan Inc.

JON ASMUNDSSON
Senior Editor
Bloomberg Markets

SPONSORED BY

FlexShares®

Foreside Fund Services, LLC, distribution

Bloomberg Markets

Andrew Chanin's HACK attracted $1.4 billion in its first eight months. Time to hire that first employee!

WHO TO STAF ETF

THE INNOVATORS

BY ANTHONY EFFINGER

WANTS

RT AN

E?

PHOTOGRAPHS BY **SASHA MASLOV**

It's not hard to enter this market. But be warned: For every rocket, like the cybersecurity phenomenon HACK, there are a whole lot of zombies.

STARTING AN EXCHANGE-TRADED FUND IS A LITTLE LIKE LAUNCHING A ROCKET.

There are lots of different contractors and regulations. There are plenty of crashes.

Andrew Chanin, the 30-year-old founder of New York–based PureFunds, watched two of his first three ETFs fail before reaching Earth orbit. They liquidated because they couldn't gather enough assets to cover expenses. A third fund barely made it aloft; it still has just $3.9 million in assets.

Chanin kept at it. In November, he launched the PureFunds ISE Cyber Security ETF (Symbol: HACK). By July, HACK had attracted $1.4 billion—one of the fastest ascents in ETF history.

It got lift from a well-timed computer breach. Just 12 days after HACK started trading, news broke that malefactors had looted the computer network at Sony Pictures Entertainment, taking terabytes of data, including Social Security numbers, salary figures, and e-mails that exposed the film studio's leaders as the petty backbiters everyone imagines Hollywood big shots to be. Relentless coverage made computer security look like a crucial and immediate concern. And its ticker symbol advertised HACK as the way to play it.

PureFunds had, and still has, just one employee: Chanin, who looks like Ferris Bueller in a suit. He was competing against the biggest ETF companies around: BlackRock, Vanguard, and State Street. But Chanin was first to market with a computer-security ETF, and he had a perfect, memorable ticker symbol in an industry that is full of them: CURE (a health-care fund), FAN (wind energy), CROP (agribusiness), IPO (recent non-U.S. IPOs), and TAN (solar).

There are 6,500 ETFs in the world, with $3 trillion of assets under management. A new one rolls out, on average, every business day. The industry is surging, for a variety of reasons. Investors are dumping mutual funds for ETFs, which have a reputation for lower fees (though mutual funds are catching up, and some Vanguard funds are cheaper). Even better, ETFs can be bought and sold like equities during the trading day, and they have tax advantages because ETF shares are created and redeemed in kind and thus almost never produce capital gains for shareholders.

Like the cheapest mutual funds, almost all ETFs are driven by indexes. With such scant fees, it's hard to pay human managers, and, thanks to index evangelists like John C. Bogle, the founder of Vanguard, many people think managers aren't worth the money.

But Bogle has never rolled out indexes like these. Take GURU—the Global X Guru Index ETF. It tracks the Solactive Guru Index built by Solactive AG, in Frankfurt. The gurus in this case are hedge fund managers, the alpha dogs who move billions in and out of stocks based on their wits and, sometimes, their whims.

A group at Solactive called the Index Committee compiles a list of hedge funds from various sources (including this magazine, according to Solactive documents) and then eliminates those managing less than $500 million, making that the guru cutoff. Also, the largest holding must be at least 4.8 percent of the fund, and the manager can't change more than 50 percent of the portfolio in a quarter. Then Solactive takes the top holding from each of those funds and puts them in an index.

But is it really an index, or is it an ever-changing list of stocks held by hedge fund managers, most of whom are active managers, Bogle's sworn enemy? Solactive CEO Steffen Scheuble says it is an index, because the methodology is strict.

In the worst cases, the index alchemists are preying on Bogle-headed investors who think indexes are always safe and cheap, says Chris Abbruzzese, chief investment officer at Rain Capital Management, which oversees $250 million in Portland, Oregon. "Just because something tracks an index doesn't mean that the index doesn't have its own tortured logic," Abbruzzese says.

Gary Gordon, president of Pacific Park Financial in Ladera Ranch, California, is more charitable. He says the biggest problem with ETFs is liquidity. Some of the small ones trade so infrequently that they are hard to sell if you own them.

That's the dirty secret of the ETF industry. All of the innovation has led to a lot of failure. Many ETFs are zombies. They stagger on with few assets and little trading. Take ProShares UltraShort Telecommunications, ticker symbol TLL. The fund, which lets investors make a bet that telecom shares are going to crater, has $146,000 of assets, and some days no shares trade. The fund started in April 2008, so ProShares, which has 146 funds with total assets of $25 billion, has had plenty of time to market it, a tough job in a bull market. ProShares declined to comment on TLL, which was set to close in September.

THE BOTTOM LINE: MOST ETFs LIVE IN OBLIVION. ALL THE CLUNKERS SHOW JUST HOW REMARKABLE HACK IS. AND CHANIN KNOWS LUCK PLAYED A BIG PART.

There are so many zombie funds that Ron Rowland, a portfolio manager at Flexible Plan Investments in Smyrna, Georgia, chronicles them on his website, Invest With an Edge, in a section titled ETF Deathwatch. "You and I could create an index in the next five minutes," Rowland says. And because it's an index, we can show how it performed during, say, the last five years, and then, *voilà*, we have a track record.

Many ETFs fail because no one ever hears about them, Rowland says, despite catchy tickers and trendy themes. It's hard to stand out in a crowded field. "The bottom 50 percent of these things are untradable," he says. Just eight ETFs accounted

for half the trading, in dollar volume, for all U.S. ETFs in June, Rowland calculated. More striking: 81 percent of all the listings totaled 2.4 percent of dollar volume.

The bottom line: Most ETFs live in oblivion. All the clunkers show just how remarkable HACK is. And Chanin knows luck played a big part. But Chanin, a hyper-driven millennial, was well prepared when good fortune arrived.

Kris Monaco heads the ETF venture group at index builder ISE. HACK tracks an index created by ISE.

He grew up in Mendham, New Jersey, and went to college at Tulane University, where he joined a club called the Jobs Group that aimed to put members in finance positions after graduation. During his senior year, a professor from the business school arranged for a group of students to go to New York for interviews. He signed up for one at Kellogg Group, a brokerage. On the way to the airport, Chanin got an e-mail list of the students scheduled for interviews. His name wasn't on it. He called, and the professor said she had decided to take just graduate students.

Irked, Chanin flew to New York anyway and showed up at Kellogg with 10 other Tulane students. They went in one at a time until Chanin was the only one left in the lobby. The hiring manager took pity on him and asked him in. He got the job. "It never hurts to try," he says.

At Kellogg, he became a market maker in ETFs, buying from sellers and selling to buyers and maintaining liquidity in various funds. He loved it. After two years, he went to Cohen Capital Group, another small New York brokerage.

He talked often with ETF issuers and suggested ideas for funds that Cohen would trade. One day, an issuer asked why he was giving away his best ideas. Why not build his own ETFs?

He and a friend from Cohen, Paul Zimnisky, considered it. "We thought you had to be a big banker to launch your own," Chanin says. Not so. He soon discovered the cottage industry that existed for building ETFs. All he needed was an idea, seed capital, and some money for expenses.

Chanin and Zimnisky left Cohen and started PureFunds in 2010. Zimnisky became CEO, Chanin COO. They had in mind three ETFs: one holding diamond miners, another tracking small silver producers, and a third made up of companies that service miners. Metals were soaring, so the new themes seemed like money magnets.

Chanin chose a New York company called International Securities Exchange to devise his indexes. ISE has cooked up indexes that track things like Wal-Mart's suppliers; Israeli tech stocks; and companies that make things that are bad for you: gambling, cigarettes, and booze. The symbol for a now-defunct ETF that tracked that last index (or SINdex, as ISE sold it) was PUF.

There's little that can't be outsourced in ETF-land. Chanin needed a prospectus, approval from the U.S. Securities and Exchange Commission, an exchange listing, and a hairball of other things that go along with launching a regulated investment company, which is what an ETF is.

He chose ETF Managers Group, in Summit, New Jersey, to make all that happen. Founder Sam Masucci is trying to be a one-stop shop for ETF entrepreneurs. He also helps with marketing and sales, which is the toughest part for small ETFs. "ETFs are sold, not bought," Masucci says. "You're fighting for shelf space." Chanin rolled out his three funds in November 2012. The diamond one sported the ticker symbol GEMS. Even so, it struggled to attract investors. Chanin tried to spread the word, appearing in videos on HardAssetsInvestor.com and other sites. GEMS and the mining ETF (MSXX) liquidated in January 2014.

Zimnisky left that same month (he didn't return phone calls asking for comment), and Chanin was on his own with one ETF, the tiny PureFunds ISE Junior Silver Small Cap Miners/Explorers ETF (SILJ). He hadn't been drawing a salary since starting PureFunds; he says he lived on a single slice of pizza for lunch, day after day. A small-cap silver fund wasn't going to pay the rent, not after metals plunged. But his friends at ISE were about to huck him a lifeline.

Like so many other crafts, building securities indexes has become something of a commodity. For years, ETF sponsors were required by the SEC to use indexes invented by other firms and to keep those firms at arm's length. Otherwise, a sponsor could develop plans to change an index by adding another stock, say, and at the

Chanin at ISE's New York offices. ISE collects a piece of the $10.5 million in fees HACK generates annually.

same time instruct employees to buy the stock. When the change in the index was executed, demand would drive the shares higher. Keeping the fund sponsor and the index provider separate would mitigate the risk of such front-running.

Then, in 2006, the SEC allowed WisdomTree Investments to "self-index," provided the methodologies behind its ETFs were rules-based and transparent.

Self-indexing is now widespread, and companies such as ISE have more competition. They have also lost some of the pricing power that brings them a chunk of an ETF's fee action. ISE, for one, became an ETF venture capitalist, investing money to get ETFs up and running, in exchange for more of the fees.

The idea for computer security struck ISE's ETF venture team, led by Kris Monaco, in 2012. Hacking was in the news, it was scary, and it was untapped. "There was no classification for computer security," Monaco says.

He reached out to some fund sponsors, but no one was interested. So he shelved the idea. Then more hackers attacked, and ISE dusted it off. Index manager Mark Abssy started digging into the industry, learning about attacks and sifting companies that defended against them.

When you make indexes, you make enemies, Abssy says. ETF wonks can have strong opinions about what mix of companies should represent an industry. "I get guys calling me up with plenty of vitriol saying, 'Why is this name in here?'" Abssy says.

For computer security, some companies are obvious, like Fortinet, which makes mostly hardware- and software-based firewalls. At other companies, like Cisco Systems, security is dwarfed by other businesses. But Cisco also controls 12 to 15 percent of the anti-hacker market, Abssy says. Monaco and Abssy decided that both focused upstarts and eclectic giants had to be included in their index.

Computer-security companies, in their analysis, fell into two broad categories: those that made infrastructure, like firewalls, and those that provided consulting and other services.

The formula for picking companies in those categories and setting their weights in the fund can be seen in the methodology guide for the ISE Cyber Security Index, a 23-page Levitical document written so strictly that the index probably could be resurrected even after an asteroid hit the Earth.

In the midst of the research, ISE reached out to Chanin at PureFunds. He loved the idea. So ISE pressed on and published the methodology on Sept. 2, 2014.

The HACK ETF launched on Nov. 12. The first headlines about the Sony hack hit Nov. 24. HACK jumped as cybersecurity stocks rallied. Then, in February, health insurer Anthem said computer intruders had stolen data on tens of millions of customers. HACK has been in orbit ever since, returning 21.7 percent from its inception through July 31, compared with 4.7 percent for the Standard & Poor's 500 Index.

With fees of 75 basis points and an asset base of $1.4 billion, HACK stands to toss off fees of $10.5 million a year, shared by ISE, PureFunds, ETF Managers, and some of their service providers. In July, Chanin launched two new funds, one tied to mobile payments (IPAY) and another tracking companies that work with so-called big data (BDAT). He plans to hire staff.

Being the only game in town almost certainly helped HACK corral assets. On July 7, it got a competitor: the First Trust Nasdaq CEA Cybersecurity ETF. Symbol: CIBR. It had $60 million of assets after a month in business.

Chanin is still blown away by how HACK took off. "It was timing," he says, "and a whole bunch of other things that I don't know about and that I wish I could bottle." BM

With assistance from **Eric Balchunas** and **Michael Weiss**.

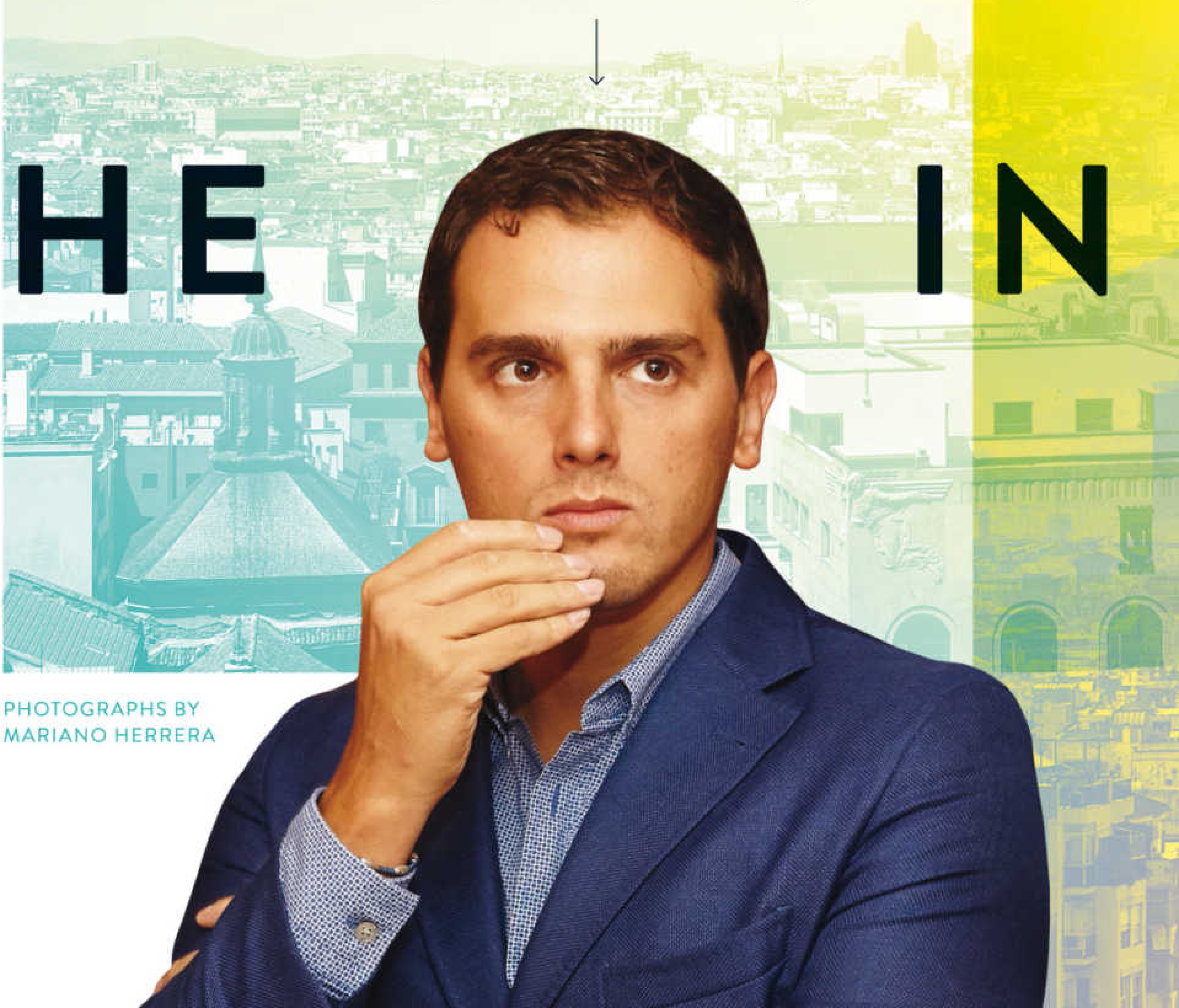
BLOOMBERG TIPS

Hacking HACK

Type **HACK <Equity> MHD <Go>** to view the holdings of the ETF. As of Aug. 3, HACK held shares of 32 companies, and its largest position was in Fortinet, a Sunnyvale, California–based maker of firewalls. Type 1 <Go> and then type **CCB <Go>** to find similar firms with the Company Classification Browser. You can use the export icon in the upper-right corner of the screen to drag and drop the stocks to a monitor you can save. Next, type **HACK US <Equity> PORT /P <Go>**. Type 14 <Go> 2 <Go> to launch the Portfolio & Risk Analytics Optimizer. You can use the saved monitor with additional cybersecurity stocks as a trade universe when running an optimization on the ETF's portfolio. JON ASMUNDSSON

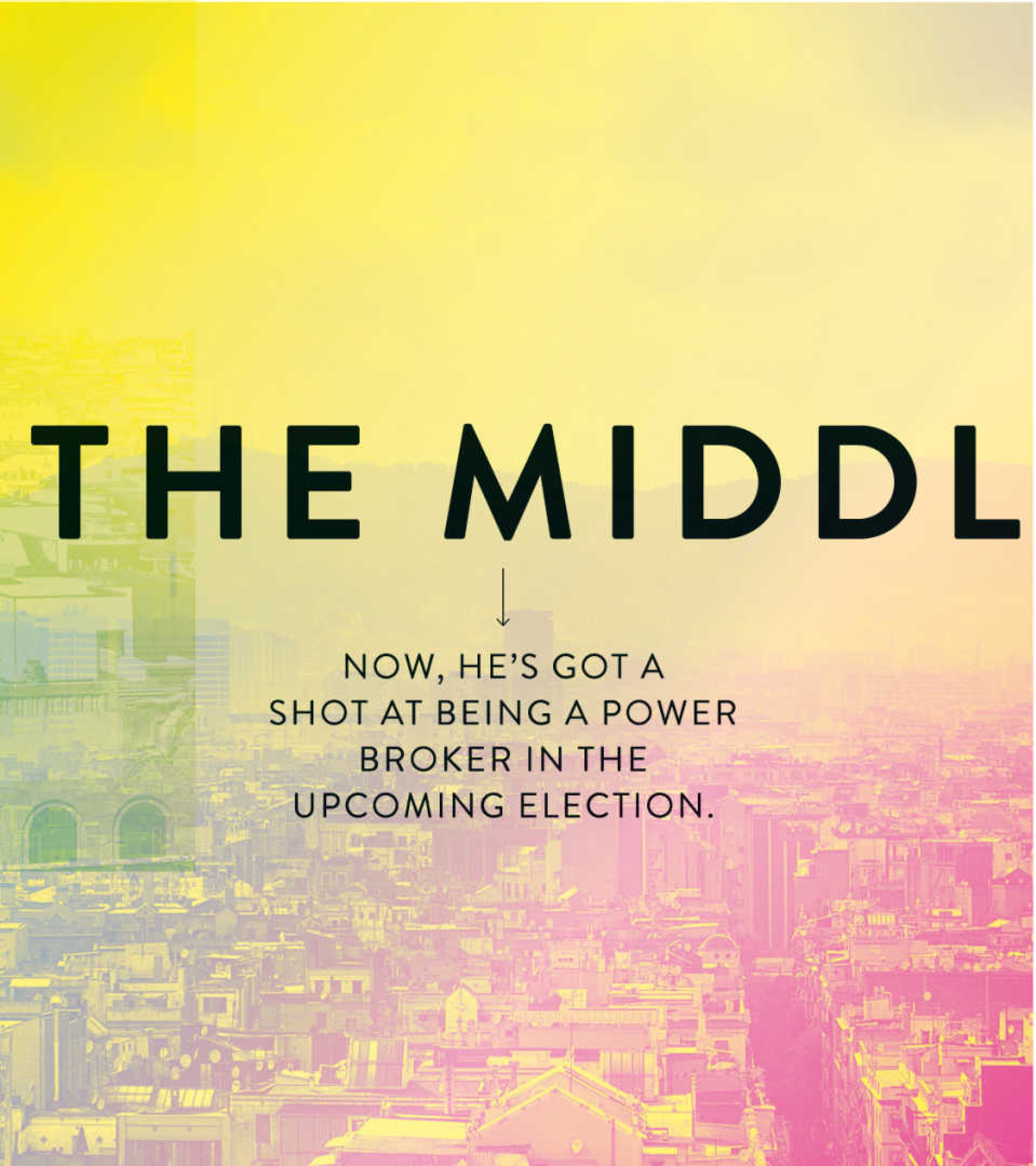
A DECADE AGO, ALBERT RIVERA POSED NAKED TO ANNOUNCE THE BIRTH OF HIS POLITICAL PARTY.

THE MAN IN



PHOTOGRAPHS BY MARIANO HERRERA

BY MARÍA TADEO,
ESTEBAN DUARTE, AND
EDWARD ROBINSON



THE MIDDLE

NOW, HE'S GOT A SHOT AT BEING A POWER BROKER IN THE UPCOMING ELECTION.

→ ALBERT RIVERA IS A MAN IN A HURRY.

The leader of Ciudadanos, a new centrist party that's roiling Spanish politics, has been on the go since dawn. He's just finished speaking to members of the American Chamber of Commerce in Spain at the Westin Palace, an ornate belle epoque–era hotel across from Madrid's Prado Museum.

On this July morning, Rivera, a 35-year-old lawyer with a made-for-TV smile, plants himself in a stuffed chair for an interview. He orders coffee. It's too hot to drink quickly. He asks for a Diet Coke. He keeps eyeing the clock to make sure he doesn't miss a flight back to his native Barcelona.

Rivera finally settles down as he starts describing his campaign. He says it will usher in the most-sweeping changes in Spain since La Transición almost 40 years ago, when the nation became a democracy again following the death of Francisco Franco. For all but a few years since then, Spain has been governed by the Spanish Socialist Workers' Party (PSOE) or the conservative People's Party (PP), led now by Prime Minister Mariano Rajoy.

Battered by corruption scandals and the fallout from Europe's worst real estate crash, the Spanish people are looking for new leaders. In the run-up to a general election that will be held before the end of the year, 31 percent of likely voters say they plan to cast their ballots for Ciudadanos (13 percent) or another challenger, Podemos (18 percent), according to averaged results of three polls conducted in late July and early August.

With these relative newcomers poised to change a two-party system into a coalition-based one, Rivera says Europe's fifth-largest economy is entering a "second transition." "We're going to fix what's been broken," Rivera says in the calm but intense manner that's become his hallmark on the hustings. "The middle class has suffered; it's been broken by crisis. My goal is to lead a government that will reform Spain."

Ciudadanos (which means *citizens*) is one of a crop of new political movements upending the euro zone as its leaders struggle to hold the 16-year-old bloc together. Unlike the right-wing National Front in France, left-wing Syriza in Greece, or Podemos, the anti-austerity Spanish upstart led by university lecturer Pablo Iglesias, Ciudadanos embraces no single, conventional ideology. Instead, the party characterizes its platform as *cambio sensato*, or *sensible change*. Echoing center-right parties in Europe, it advocates lowering Spain's corporate tax rate to 25 percent from 30 percent, capping income taxes at 40 percent, slashing government spending by merging small municipalities, and stoking entrepreneurship and innovation. But the party also pushes policies that reflect liberal or libertarian views: It wants to legalize prostitution and marijuana and invest more in education and health care.

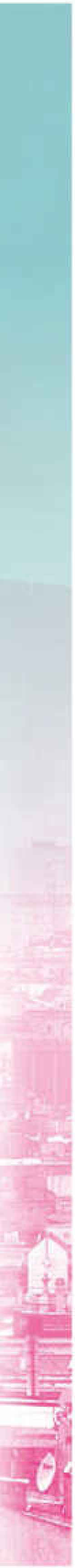
With his centrist approach, Rivera is drawing support away from both the right and the left. That puts him in a pretty sweet spot because neither the PP nor the PSOE is likely to win enough seats in the Cortes Generales, Spain's parliament, to form a government. For either the PP or the PSOE, Ciudadanos would make a more attractive ally than the doctrinaire, leftist Podemos, says José María de Areilza Carvajal, a professor of public law at the Madrid campus of ESADE University. "The main scenario is the PP will need a coalition partner, and that will be Ciudadanos," he says. "In the second scenario, Pedro Sánchez, the young leader of the Socialists, wins and also turns to Ciudadanos. So Rivera plays kingmaker."

Rivera is coy about being a junior partner in a coalition. "I don't want to be an uninvited guest in anyone's government," he says. "My goal is to govern." The very fact that Rivera is even in a position to play a pivotal role is remarkable for a man who unveiled Ciudadanos in 2006 by posing nude, his hands modestly forming a fig leaf, on campaign posters that proclaimed "*Ha nacido tu partido*" ("Your party has been born").

Ciudadanos was founded by Barcelona intellectuals who opposed Catalan independence. Rivera, an athletic man who won swimming championships in high

LEFT TO RIGHT: ENRIC CATALA/CORBIS; CESAR MANSO/GETTY IMAGES

Albert Rivera, below, and **Pablo Iglesias** of Podemos, left, lead parties that are upending Spanish politics.



school, was working as an attorney at La Caixa, now CaixaBank, the Catalonia region's No. 1 lender by assets. A gifted public speaker, Rivera jumped into the fray and won the party's presidency. But Ciudadanos had trouble gaining traction. It won three seats in the Catalonian parliament in 2006; four years later, it still had three.

Then the bottom fell out of Spain's runaway construction market. Beginning in January 2011, the economy contracted for 10 consecutive quarters. Unemployment peaked at 27 percent in March 2013; more than half of all Spaniards under 25 were jobless. Rajoy, a stern Galician who became prime minister in December 2011, scrambled to enact German-style austerity, breaking a raft of election promises. He made it easier for companies to fire employees and harder for unions to negotiate contracts across entire industries.

Rajoy's measures curbed wage inflation and made Spanish companies more competitive, according to the Organization for Economic Cooperation and Development. Even though the employment picture has improved by only a few percentage points, the economy has grown steadily since September 2013—up 1 percent in the second quarter of this year over the previous quarter. Spain is now outperforming Germany, France, and even the U.K.

Javier Maroto, a PP deputy secretary, says Ciudadanos, with zero experience legislating in the Spanish parliament or even managing a municipality, is ill-prepared to steer economic recovery. "We need experienced managers willing to roll up their sleeves and get the job done," he says.

Ángela Ballester, a member of Podemos's executive committee, says Rivera's convenient embrace of policies of the left and right won't result in fundamental change. "Ciudadanos represents old politics with a new look," she says. "Instead of being an old guy in a suit, it's a younger face. But those are superficial tweaks. Their proposals are no different to those of the old parties."

Even if that's true, the big parties face a massive challenge. Almost 5 million people remain out of work. A cascade of corruption scandals involving the PP has outraged Spaniards. In a high-profile case, an investigating magistrate said he found evidence that could show that two former PP party treasurers, Luis Bárcenas and Álvaro Lapuerta, were making unlawful payments out of a slush fund; a trial is scheduled for next year. Lapuerta's lawyer, Cristóbal Martell, says his client did nothing illegal. Bárcenas, who has admitted to running the fund, accused Rajoy of accepting about €250,000 ($273,000) in illegal payments. Rajoy has denied any wrongdoing.

A poll published on Aug. 5 by CIS, a government research arm, showed that 54.3 percent of Spaniards say they have "no faith" in Rajoy. In municipal elections in May, the PP suffered its worst drubbing in 20 years. It lost the mayorship of Madrid to Manuela Carmena, a human rights lawyer elected under the banner of Ahora Madrid, a group backed by Podemos. Ciudadanos won 74 of 1,248 seats on regional councils—a numerically small but nonetheless breakout showing.

With the election approaching, Rivera faces a crucial test. The PP, the PSOE, and their allies in business, the media, and the civil service will deploy political machines to attack the insurgent parties, says Kenneth Dubin, a political scientist at Anglia Ruskin University in Cambridge, England. For Ciudadanos to take off, Rivera must demonstrate that it's a national force and not simply a regional player. "Rivera can be a kingmaker only if his party wins seats," Dubin says.

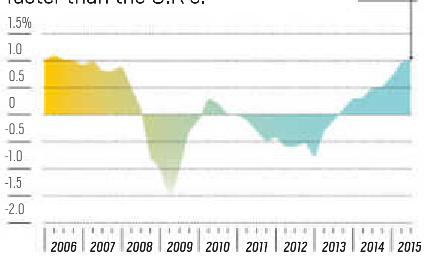
For his part, Rajoy compares the PP's decades of experience in government or opposition with Podemos's and Ciudadanos' "15 minutes." He likes to link Podemos to Syriza's stewardship of Greece's cratering economy. "Is that the change that the new Spanish parties of extreme left are offering?" Rajoy said on July 11. Ciudadanos, he said, is "weightless ... like soap bubbles."

At the Westin Palace, an undaunted Rivera is arguing that his message of competence and integrity will resonate with voters. "The party system is corrupt and lacks transparency," he says. "Podemos is promising the impossible. How about we go for the middle ground? How about if we try and fix the system without destroying it?" For him, the election is about more than getting elected. "We need to understand that this isn't about just forming the next government," he says. "It's about creating a new era for Spain." BM

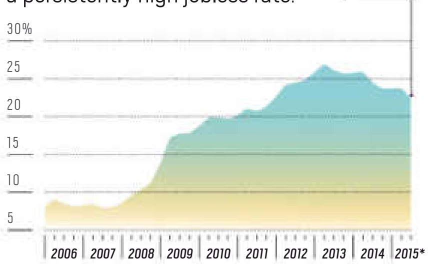
The Long Haul

Stiff austerity measures have helped Spain slowly get out from under the wreckage of Europe's worst real estate crash.

GDP Growth (Quarter over quarter)
The economy has been expanding faster than the U.K.'s.



Unemployment
The nation has struggled to tame a persistently high jobless rate.



**Second quarter. Source: Bloomberg*

BLOOMBERG TIPS

PMI Analytics on Spain

To get insight into changes in Spain's economy, you can use PMI data compiled by Markit Economics. PMI economic indicators are based on monthly surveys of purchasing managers and other executives at representative companies in more than 30 countries, including Spain. Type **ECST <Go>** on the Bloomberg Professional service. Tab in to the field, enter *SPAIN*, and click on the matching Countries item. Scroll down in the left panel and click on the plus sign to the left of Surveys/Cyclical Indicators to expand the list. Expand the Business Conditions list and then click on PMI Surveys to display the data. For more information on the surveys and data, type **PMI <Go>**. JON ASMUNDSSON

Sotheby's
INTERNATIONAL REALTY

UNIQUE IMPRESSIONS WORLDWIDE **SIR.COM**

ABACO, BAHAMAS

Gumelemi Cay. Private island, 8 acres with 3 private beaches part of the Baker's Bay Golf & Ocean Club community. Just a 1 minute boat ride to golf, fine dining and more. WEB: 25EWS7. **$17,900,000** US. George.Damianos@SothebysRealty.com
Damianos Sotheby's International Realty
+1 242.424.9699 | SIRbahamas.com

ROSS, CA

Premier new construction (artist rendering) on 3.3 acres with flat lawn, infinity pool, and breathtaking views. Stunning modern design, 5 BR, 4.5 baths, 5,500 sf. Available October 2015. **$8,000,000**. Jenny Mattson.
Decker Bullock Sotheby's International Realty
+1 415.786.6183 | deckerbullocksir.com

SONOMA, CA

Tuscan-style, approximately 3,300 sf residence with detached 1 BR, 1 bath guest house. Syrah vines, olive trees, views, pool with pavilion. Total of approx 12.34 acres. WEB: 0243814. **$6,795,000**. Brenda Brooks.
Sotheby's International Realty Wine Country Brokerage
+1 707.935.2298 | CypressHillFarmSonoma.com

SONOMA, CA

Approx 140 acre ranch, 11,800 sf home with 6 BR, lake, beach, softball diamond, tennis court, gardens, pool and manager's building. 15 mins to Sonoma Plaza, 60 mins to San Francisco. WEB: 0243305. Price upon request. Donald Van de Mark.
Sotheby's International Realty Wine Country Brokerage
+1 707.337.2227 | SonomaRanchEstate.com

NEW CANAAN, CT

New construction in sought-after location. 8,500+ sf on 3 finished floors. 3,000 sf more in the unfinished lower level. Flat 2.06 landscaped acres with room for pool site & tennis. 1 hour to Manhattan. **$4,949,000**. Robert Blosio.
William Pitt Sotheby's International Realty
+1 203.249.7164 | williampitt.com

NEW CANAAN, CT

Vintage charm combined with renovated open floor plan overlooking breathtaking pool and exquisite gardens, yielding a spa-like feel within minutes to town. 4-car garage affords a car lover's dream. 2.3 acres. **$2,450,000**. Christine Williams.
William Pitt Sotheby's International Realty
+1 203.856.7559 | williampitt.com

LAKE SUNAPEE, NH

Located on a point with 1.7 acres, two lots, main house with 5 BR, guest house with 2-3 BR. Both beautifully finished and maintained. Two slip boathouse. Dock and sandy swimming. **$5,995,000**. Bo Quackenbos.
Four Seasons Sotheby's International Realty
+1 603.763.5700 | birchpointsunapee.com

NEW YORK, NY

Instant lifestyle and glamour await you in this fully furnished residence in one of Fifth Avenue's most exclusive white-glove co-ops. WEB: 00110148. **$22,000,000**. A. Koffman and J. Janssens.
Sotheby's International Realty
East Side Manhattan Brokerage
+1 212.606.7688/606.7670 | sothebyshomes.com/nyc

NEW YORK, NY

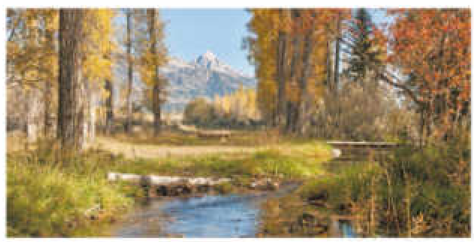
View spectacular sunsets or be bathed in natural light through floor to ceiling windows from this split 2 BR, 2.5 bath condo. WEB: 00110223. **$2,895,000**. Pauline Evans & Rebecca Cavallaro.
Sotheby's International Realty
East Side Manhattan Brokerage
+1 212.400.8740/606.7641 | sothebyshomes.com/nyc

DALLAS, TX

New construction with estimated completion in Fall 2015, this home is in THE iconic location in University Park, TX. Stunning views to the creek, wonderful appeal, presence, quality, style. Built by SignificantBuilding.com. **$4,495,000**. info@beckyfrey.com
Briggs Freeman Sotheby's International Realty
+1 214.536.4727 | bfsir.com

NORTHEAST WASHINGTON STATE

A retreat sited upon 900 acres. A 150 acre private lake reflects a 12,000 sf log home, adjacent 8,000 sf spa pavilion and pool house. Includes recreational and maintenance vehicles. Helipad with FBO airports nearby. **$11,000,000**. Michael X. Ford.
Realogics Sotheby's International Realty
+1 206.448.5752 | BuckQuarterRanch.com



JACKSON HOLE, WY

Ranch 10 of the Bar B Bar features approximately 98 acres with live water, Teton views, Snake River frontage, wildlife, meadows, mature trees, unsurpassed privacy and proximity to Jackson's amenities. Price upon request. TomEvansRE@JHSIR.com
Jackson Hole Sotheby's International Realty
+1 307.739.8149 | jhsir.com

TYPE SIRA <GO>


Evaluate deal risk
with the
Interactive Deal Tool
Available on multiborrower
U.S. CMBS presales

STRATEGIES

PROFILE

Picking Stocks by Watching Bonds

BY JON ASMUNDSSON

Sandy Rufenacht's Aquila Three Peaks Opportunity Growth Fund beat 99 percent of peers during the past three years by buying shares in companies that pay down debt.

SANDY RUFENACHT is a bond guy who figured out stocks.

The co-manager of the Aquila Three Peaks Opportunity Growth Fund says his high-yield-bond research leads him to companies whose stocks are primed to rise. "We find these ideas in advance of the equity market," he says.

Rufenacht's approach is based on something he calls "return on debt paydown." The idea goes like this: Starting with companies that have high-yield bonds outstanding, identify the ones that plan to pay down debt and generate enough free cash flow to do so. Over time, as a company trims borrowing, debt-servicing costs decline, and more cash drops to the bottom line. Then, thanks to an improved credit profile, the company can get rid of restrictive covenants and refinance. "With the new bond proceeds, they now do something that gets the equity market's attention," Rufenacht, 50, says. "They buy stock back. They pay a dividend. They increase the dividend. Or they do an accretive acquisition with very cheap cost of financing—and the stock flies!"

The $393 million Aquila Three Peaks fund, which Rufenacht oversees with co-manager Zach Miller, has grabbed on to some of those flying stocks, to judge by its track record. For the 12 months ended on Aug. 3, the fund's institutional share class gained 17.1 percent. That topped 94 percent of peer funds, according to data compiled by Bloomberg. For three years, the Aquila Three Peaks fund rose 24.8 percent annually on average, beating 99 percent of similar funds. For five years, the fund gained 19.5 percent annually, which was better than 98 percent of peers.

A NATIVE OF Imperial, Nebraska, Rufenacht has bond roots that go back two decades. He managed the Janus High-Yield Fund from its launch in 1995 to 2003, when he left Janus Capital Group to start Three Peaks Capital Management. The Castle Rock, Colorado–based firm now oversees about $750 million in assets. In 2006, Rufenacht started a high-yield mutual fund for Aquila Group of Funds, a New York–based municipal bond shop. He'd been managing stocks for clients in separate accounts

SANDY RUFENACHT

FOUNDER AND CIO, THREE PEAKS CAPITAL MANAGEMENT

- Looks for high-yield issuers with **free cash flow**.
- Seeks companies that plan to **pay down debt**.
- Avoids companies in **cyclical industries**.

Rufenacht on a golf course near Three Peaks' Colorado headquarters

PHOTOGRAPH BY **MATT NAGER**

at Three Peaks. So in October 2010, he took the reins at Aquila's equity fund, changing its strategy.

Rufenacht says his equity strategy comes out of the conservative approach to high yield he developed at Janus. Its main aim, he says, is to avoid defaults. "I wanted to use the asset class but weed my way through it," he says.

I WANTED TO USE HIGH YIELD BUT WEED MY WAY THROUGH THE ASSET CLASS, RUFENACHT SAYS.

To do that, Rufenacht focuses on four things. First, he buys only true high-yield bonds, not other securities such as convertibles that junk-bond investors sometimes buy. Second, he avoids companies in cyclical industries that tend to end up with too much debt when the economy turns down. "I instead try to find anti-recessionary types of industries like the supermarkets, cable, health care—even the casino industry historically," he says. Third, he aims for shorter duration than the benchmark to reduce risk from rising rates. Fourth, he seeks companies that have articulated a desire to pay down debt—or have the ability to do so. "What I'm really looking for is that they've got this free cash flow," Rufenacht says. "Debt doesn't merely stay flat, but it actually goes down because they take the checkbook out and they pay off bank debt."

TIP BOX

Type **CAST <Go>** for the capital structure of a selected company.

Rufenacht says that the approach enables him to find companies with "the perfect balance sheet." Such firms "have enough leverage to propel shareholders' equity, but not so much leverage that they're looked down on in the high-yield market."

Consider Sealed Air, for example. Back in 2011, the maker of Bubble Wrap packaging bought Diversey Holdings, a maker of cleaning products, in a $4.3 billion deal. Before the acquisition, Sealed Air had about $2 billion in bonds and loans. Afterward, its total debt jumped to $5.9 billion.

The next year, the company announced that cutting debt was one of its main goals. "Sealed Air even linked a significant portion of CEO compensation to achieving its debt-reduction goals," Rufenacht says. In mid-2012, when the fund first bought Sealed Air shares, the stock traded at about $15.

ONE OF THE bonds that Sealed Air sold in 2011 to finance the Diversey acquisition was a $750 million issue of 8.375 percent senior notes due in 2021. It was the company's most restrictive bond, Miller, 29, says. Among its covenants was a so-called limitation on restricted payments. Commonly called an RP basket, the covenant constrained the pot of money that Sealed Air could use to pay dividends or buy back stock.

In 2014, the company offered to pay a consent fee to loosen the covenant, but bondholders rejected the proposal. "We knew that the writing was on the wall that Sealed Air was committed to executing a large share repurchase program," Miller says. So the fund bought more shares, he says. This June, the company got rid of the bond in a mandatory tender offer. In July, Sealed Air, whose market value was $11 billion, announced that it would buy back up to $1.5 billion of its stock. Shares traded at $53.51 on Aug. 3, having risen about 50 percent a year since the fund first bought them.

Rufenacht says that at its root, the strategy draws on a simple premise. "I'm from a small town in Nebraska," he says. "When you borrow money, you pay it back." That's always a good thing, he says.

Jon Asmundsson is Strategies editor of *Bloomberg Markets*.
jasmundsson@bloomberg.net

TRACKING HIGH YIELD

Sandy Rufenacht says that some investors don't appreciate how interconnected the bond and stock markets are. "I'll hear someone talk negatively about the high-yield market but be very boisterous about the equity market," he says. "I'm like, 'You cannot say that.'" In fact, Rufenacht says, what happens in high yield is a leading indicator of what's coming in stocks. To track the high-yield market, type **FICM HY <Go>** on the Bloomberg Professional service for the Fixed Income Credit Monitor function. JON ASMUNDSSON

Using Warren Buffett's Metric to Gauge Markets

BY CONSTANTIN COSEREANU, CFA

MANY MARKETS AROUND the world look like they're near peak valuations when analyzed with traditional fundamental and technical measures. An analysis that Warren Buffett prefers, however, suggests that stocks in some markets may still have room to rise.

Buffett, the 85-year-old CEO of Berkshire Hathaway, likes to compare a country's market capitalization with gross domestic product to get a sense of whether stocks are overvalued or not, according to Alice Schroeder's *The Snowball: Warren Buffett and the Business of Life*.

To create such a gauge for a particular country, what you need are the tickers for its market cap and its GDP. To find market cap tickers, type **WCAP <Go>** on the Bloomberg Professional service. For example, let's take a look at Spain, whose benchmark index rose 9.6 percent this year through Aug. 3. To chart its market cap, type 15 <Go> and click on WCAUSPAI <Index> GP <Go>. As of Aug. 3, the total value of stocks listed in Spain was $768 billion.

TO FIND THE ticker for Spanish GDP, type SPAIN GDP on the command line of a Bloomberg screen and click on the World Bank Spain GDP in Current USD item in the list of matches that appears. The ticker is WGDPSPAI <Index>.

You can use the Custom Index Library (CIX) function to create a ratio of the two data items in a custom metric. Type **CIX <Go>**, click on the Create CIX button, and select Custom (CIXN). In the TICKER field, enter a ticker, such as *SPMKTGDP*. In the NAME field, enter a name. Then, in the large field, enter a formula for your index using standard mathematical operators. To track Spain's market cap divided by its GDP, enter *(WCAUSPAI Index/1000)/ WGDPSPAI Index*. (The market cap data is in millions of dollars, so dividing by 1,000 scales it into the same terms as the GDP data, which is in billions.) To finish, click on the Create button.

You can now use your index in Bloomberg analytics. Type **.SPMKTGDP <Index> GP M <Go>** to graph it. As of Aug. 3, the valuation metric was 40 percent lower than its 2007 peak, suggesting the market still has room to rise. In addition to the indexes you create, you can use some ready-made Buffett-style indexes that we've created for a number of major markets. For tickers, see the table at left.

Type **CIX <Go>** 1 <Go> 1 <Go> to create a custom index for a particular market that interests you.

TRACKING MAJOR MARKETS

THESE READY-MADE INDEXES LET YOU COMPARE VALUATIONS BUFFETT STYLE.

BRAZIL	.BZMKTGDP <Index>
CANADA	.CAMKTGDP <Index>
CHINA	.CHMKTGDP <Index>
GERMANY	.GEMKTGDP <Index>
INDIA	.INMKTGDP <Index>
JAPAN	.JPMKTGDP <Index>
RUSSIA	.RUMKTGDP <Index>
SWITZERLAND	.SWMKTGDP <Index>
U.K.	.UKMKTGDP <Index>
U.S.	.USMKTGDP <Index>

Constantin Cosereanu, CFA, is a portfolio and risk specialist at Bloomberg in London. ccosereanu@bloomberg.net

Hedge Funds

HFND <Go>
is the Hedge Fund Home Page, which lets you download accredited-investor and qualified-purchaser questionnaires to request access to restricted funds.

FSRC <Go>
lets you search for funds that match criteria you specify.

FREP <Go>
lets you generate reports on the performance of a selected fund.

HFA <Go>
lets you analyze fund performance.

NI HEDGE <Go>
displays headlines of news stories related to hedge funds.

BRIEF <Go>
enables you to subscribe to the *Hedge Funds and Hedge Funds Europe* Bloomberg Brief newsletters.

FLNG <Go>
lets you analyze 13F filings for a selected hedge fund manager and aggregated filings.

FMAP <Go>
displays a pie chart that lets you analyze fund performance.

BAIF <Go>
lets you rank return and risk data for Bloomberg Active Indices for Funds.

FSTA <Go>
lets you analyze the style of a selected fund versus a benchmark.

FSCO <Go>
scores hedge funds by size or performance.

HFNI <Go>
lets you access hedge fund indexes.

BEMS <Go>
displays information about Bloomberg's Execution Management System.

↑ **PORT <Go>**
lets you analyze portfolio and fund performance including alpha, characteristics, risk, and more.

XLTP XRSK <Go>
lets you download a spreadsheet that displays key risk metrics for a selected hedge fund or fund of funds.

BGIN <Go>
displays information about Bloomberg's Asset and Investment Manager tools for portfolio management, trading, and operations at new hedge funds.

BVIP <Go>
provides information about Bloomberg's BVAL Derivatives evaluated pricing service.

MARS <Go>
enables you to manage risk for, stress-test, and perform scenario analysis on a multiasset portfolio that includes derivatives.

FIT <Go>
lets you access Bloomberg's electronic-trading platform for U.S. rates and a range of sovereign bonds.

FXGO <Go>
lets you access information on Bloomberg's electronic-trading platform for foreign exchange, deposits, and precious metals.

MNDS <Go>
allows enabled users to screen for investment mandates from pension plans, endowments, and other allocators.

Compiled by
JON ASMUNDSSON
jasmundsson@bloomberg.net

PULL OUT AND SAVE. // **PRESS <HELP> TWICE** TO SEND A QUESTION TO THE BLOOMBERG ANALYTICS HELP DESK.

TEAR OUT AND SAVE.


EVEN ONE GAP IN YOUR STRATEGY IS ONE TOO MANY.
MDY
You can tell pretty quickly if your sprinkler isn't cutting it. But what about your investment strategy?
State Street Global Advisors can help to make your strategy more watertight. Twenty years ago, we introduced the first exchange traded fund. Today there are over 140* SPDR ETFs to choose from. Covering every market segment from Mid Caps to Fixed Income, allowing you to precisely match your investments to your strategy.
If the holes in your portfolio need tending to, visit us at spdrs.com/highlights.
STATE STREET GLOBAL ADVISORS.
SPDR®

Is the Worst Over for China's Stock Markets? Probably Not

BY JING HUI HENG

CHINA'S CSI 300 Index plunged 31 percent from June 12 to July 8. Yet, even after that drop, the benchmark remained 68 percent higher for the year through July 8.

So is the worst over for China's stocks? Here are some tools and data you can use to assess the market.

To start, let's compare the stock index with a monthly estimate of China's gross domestic product. First, type **SHSN300 <Index> GP <Go>** on the Bloomberg Professional service to graph the market benchmark. For a five-year chart, click on 5Y.

Type **SHSN300 <Index> GP <Go>** to chart the CSI 300 Index.

Click on Security/Study and then on Add Security. Enter *CHINA MONTHLY GDP* in the field that appears. Click on the China Bloomberg Monthly GDP Estimate YoY item for data generated by a Bloomberg econometric model that estimates monthly GDP numbers based on the relationship between actual quarterly GDP figures and monthly indicators such as industrial production and electricity generation.

The two gauges showed similar, slightly downward trends from late 2010 to mid-2014, when they diverged. That suggests that the big rally and the crash weren't driven by fundamental changes in the economy.

Type **HVG <Go>** to graph realized volatility, which hit highs in July.

WITH A LOT of speculation in the market, volatility is likely to be high. To track swings in the benchmark, type **HVG <Go>** for the Volatility Comparison function. Click on the arrow to the right of Period, select Daily: 5 Years, and press <Go> to chart five years of data. Realized volatility hit highs this year, with 30-day volatility reaching 68 percent on July 27.

One of the causes of the spike in volatility has been investors ramping up borrowing to buy stock. To track data on margin lending, type **ECST <Go>** for the World Economic Statistics function. Click on the Search button on the red tool bar and enter *SHANGHAI MARGIN* in the SEARCH TEXT field. In the list of matches, click on the CN Shanghai SE Outstanding Balance of Margin Transactions Margin Purchase item. Then press <Go>. To graph the

TIP BOX

Type **BI CHINA <Go>** for Bloomberg Intelligence's China research.

margin data, right click on the result and select GP–Price Graph.

With regulators tightening margin requirements, investors have been forced to sell off shares of stocks that aren't halted to cover margin calls. (Amid the rout, many companies suspended trading in their shares.) As a result, the amount of margin outstanding dropped 44 percent from mid-June to Aug. 3. However, it remained 191 percent higher than it had been a year earlier. That still poses risks.

From a macro perspective, China's market appears to be in an unstable position. Taking a top-down approach to analyzing the CSI 300 shows that high valuations remain.

SHSN300 Index | 5) Display | 6) Output | 7) Alert
SHSE-SZSE CSI300 INDEX | 300 Members and 10 Groups, Index Weigh
1) Members | 3) Historical Summary
Search | As of 07/10/2015

	Ticker	Name	Index Weight(%)	Price	Total 612:2015 /08	Total Return:Y-1
11)	SZ399915	SZ CSI300 INFO TECH INDX	6.302465	2,270.4571	-42.554491	135.812557
12)	SZ399909	SZ CSI300 MATERIALINDX	6.347970	2,472.3631	-42.307437	104.346702
13)	SZ399910	SZ CSI300 INDUSTRL INDX	17.033835	3,458.5329	-39.863559	197.613371
14)	SZ399917	SZ CSI300 UTILITIES INDX	4.121065	2,647.6140	-39.548321	132.758215
15)	SZ399916	SZ CSI300 TELECOM INDX	1.173292	3,183.6030	-37.136447	91.647086
16)	SZ399911	SZ CSI300 CONS DISCR IDX	10.561930	5,807.8789	-34.416322	91.867098
17)	SZ399912	SZ CSI300 CONS STPLS IDX	6.237900	7,955.6899	-29.233059	73.221832
18)	SZ399913	SZ CSI300 HEALTHCARE IDX	3.867990	7,799.9229	-28.190095	66.190528
19)	SZ399908	SZ CSI300 ENERGY INDX	3.432600	2,449.4309	-26.400519	62.676735
20)	SZ399914	SZ CSI300 FINANCIAL INDX	40.920953	6,766.9209	-17.028412	120.589381

BIGGEST DROP
IT stocks fell the most in the crash.

Type **SHSN300 <Index> GWGT <Go>** to analyze industries in the index.

SZ399915 Index | 5) Display | 6) Output | 7) Alert | Member Weightings
Shenzhen CSI 300 Information Technolog... 28 Members, Index Weight (%) Calculated by Bloomb... Currency LCL
1) Members | 3) Historical Summary
Search | As of 07/23/2015

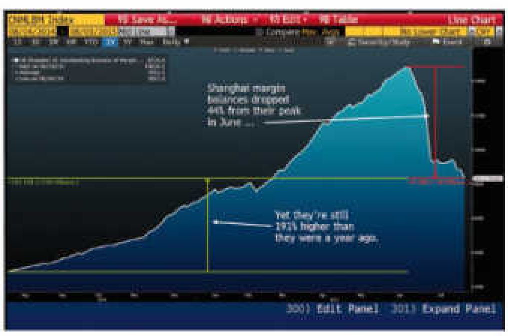
	Ticker		Name	Index Weight(%)	Price	BEst P/E BF12M	P/E
11)	000503	CH	Searainbow Holding Corp	3.20	35.7400	608.07	5.96k
12)	002129	CH	Tianjin Zhonghuan Semiconduc...	2.19	19.1700	110.56	300.60
13)	300059	CH	East Money Information Co Ltd	9.05	61.3600	82.69	296.33
14)	300104	CH	Leshi Internet Information & T...	6.17	53.6100	127.18	265.06
15)	600570	CH	Hundsun Technologies Inc	5.61	91.1900	100.40	152.06
16)	600588	CH	Yonyou Network Technology Co...	4.20	48.0000	80.82	131.63
17)	002230	CH	Iflytek Co Ltd	4.46	42.2200	74.38	129.85
18)	002153	CH	Beijing Shiji Information Tech...	2.03	132.0000	74.22	105.72
19)	600718	CH	Neusoft Corp	2.17	20.2700	46.08	99.51
20)	603000	CH	People.cn Co Ltd	1.93	28.1000	54.77	93.67
21)	300017	CH	Wangsu Science & Technology ...	3.44	56.5800	40.78	73.61
22)	002475	CH	Luxshare Precision Industry C...	2.40	38.5900	36.88	72.82
23)	000970	CH	Beijing Zhong Ke San Huan Hig...	2.05	19.3000	47.39	70.03
24)	600804	CH	Dr Peng Telecom & Media Gro...	3.63	26.2100	39.35	69.10
25)	600271	CH	Aisino Co Ltd	4.87	70.6800	35.62	54.73
26)	002456	CH	Shenzhen O-film Tech Co Ltd	2.84	36.8400	30.77	53.02
27)	600100	CH	Tsinghua Tongfang Co Ltd	4.71	21.2800	--	51.12
28)	601231	CH	Universal Scientific Industrial ...	0.45	16.5200	26.42	50.15
29)	002410	CH	Glodon Software Co Ltd	2.12	25.1100	31.58	47.57
30)	600703	CH	Sanan Optoelectronics Co Ltd	5.57	31.1700	32.25	46.48
31)	002236	CH	Zhejiang Dahua Technology Co ...	3.00	41.2400	26.59	45.76

4) Stats | Grouping None | Zoom 100%

Type **SZ399915 <Index> MEMB <Go>** to examine info tech companies.

FOR A BREAKDOWN of the CSI 300 by industry, type **SHSN300 <Index> GWGT <Go>**. To look at how performance stood immediately after the crash, enter *07/10/2015* in the AS OF field. To add a column showing performance during the 12 months ended on that date, tab in to the field to the right, enter *TOTAL RETURN*, and click on the match. In the field that appears, select Last Close–1 Year. Then press <Go>. To track how the industries performed peak to trough during the crash, enter *TOTAL RETURN* again in the field to the right of the date and select the item. Select Customize Period.... In the Custom window that appears, click on the circle to the left of By Exact Date. Enter *06/12/15* and *07/08/15* and click on Update. For the one-year period, all sectors rallied. In the recent selloff, the largest drop was in information technology companies.

To dig into the members of that tech index, type **SZ399915 <Index> MEMB <Go>**. In the AS OF field, enter *07/10/2015*. Enter *PE* in the field to the right and click on the Price Earnings Ratio (P/E) match. Select Current and press <Go>. To add a column showing forward PEs, enter *PE* again and click on the BEst P/E Ratio match. Select Blended Forward 12 Month and press <Go>. Right click on the BEst P/E BF12M column heading and select Sort Descending.



Type **CNMLBM <Index> GP <Go>** to chart Shanghai margin.

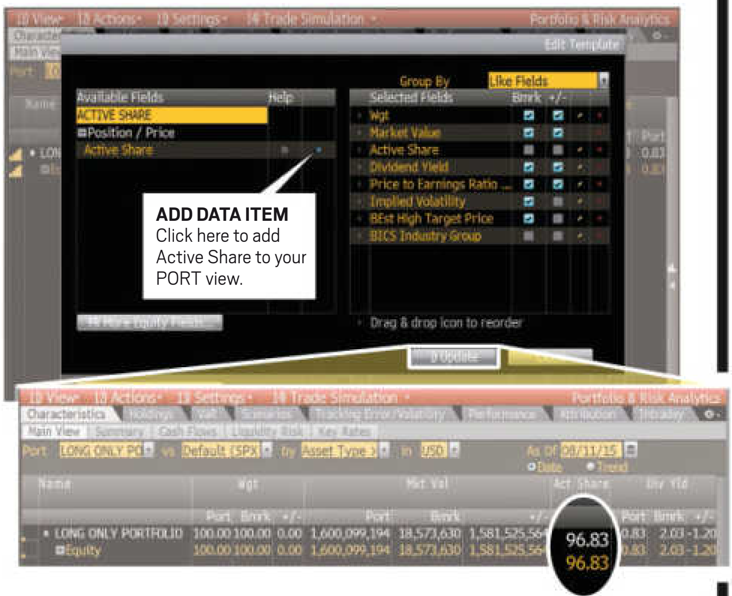
Even after the crash, price-earnings ratios remained high. As of July 10, SeaRainbow Holding, a Haikou-based e-commerce company, had last traded at a price that was 5,957 times trailing 12-month earnings. Given such valuations, there's plenty of scope for further share price drops.

Government intervention after the crash has momentarily stabilized the market. Yet to judge by fundamental indicators, many of China's equities appear to remain at inflated levels, with significant margin risk.

Jing Hui Heng is on the staff of the Global Data department at Bloomberg in Singapore. jheng32@bloomberg.net

Q: How can I track my fund's active share?

A: Active share, a measure of how much an equity portfolio differs from its benchmark, was laid out in a 2009 paper by Martijn Cremers and Antti Petajisto, who were then both professors at the Yale School of Management. Calculated as one half the sum of the differences between the weight of each stock in the portfolio and its weight in the benchmark, active share values range from 0 to 100. An active share of 0 indicates that the portfolio exactly mimics its benchmark, while 100 represents a portfolio that's completely different from the index. The Portfolio & Risk Analytics (PORT) function has been enhanced to let you see the active share of your fund. Type **PORT <Go>** on the Bloomberg Professional service and click on the arrow to the right of Port to select a fund or portfolio. Click on the Characteristics tab, if it's not already selected. Right click on a column heading and select Add/Remove Fields. Enter *ACTIVE SHARE* in the field below Available Fields and press <Go>. Click on the blue plus sign to select that measure and then click on Update.



HELPFUL TOOLS FOR TRACKING FUNDS

FSRC <Go> enables you to screen for funds that fit your needs.
FSCO <Go> lets you create models to score and rank funds.
FMAP <Go> maps fund performance and risk.
FREP <Go> lets you generate detailed reports on a selected fund.

NEW LEAGUE TABLES

The League Tables function has been redesigned to let you access more than 200 standard league tables covering issuance of bonds, notes, loans, and stocks. In addition, the function has been integrated with the Fixed Income Search function to enable you to create custom league tables. To view the standard ranking of managers of offshore Chinese yuan bond deals, for example, type **LEAG <Go>** and click on All Official Bond & Note Tables. Scroll down in the list to the Asia section and click on Offshore CNY Bonds.

SPOTTING OUTLIERS

Security monitors have been enhanced to let you quickly identify price or volume levels that are unusual compared with historical averages. To add columns that flag outliers to an existing monitor, click on Indicators and select Price and Volume Outliers. For an example monitor, type **MONITOR SAMPLE 54803 <Go>**. You can also turn other data into outlier signals. For more information, type DOCS #2073488 <Go>.

FORECASTS FOR OFFSHORE YUAN

The FX Forecasts function now lets you see forecasts for offshore deliverable renminbi. Type **FXFC CNH <Go>**.

Compiled by
JON ASMUNDSSON
jasmundsson@bloomberg.net

TIP BOX
For more recent enhancements, type **NEW <Go>**.

October 2015, volume 24, number 9. BLOOMBERG MARKETS (ISSN 1531-5061, USPS 008-897) is published monthly with a combined July/August issue by Bloomberg Finance L.P., 731 Lexington Ave., New York, NY 10022, and distributed free to subscribers of the BLOOMBERG PROFESSIONAL service. POSTMASTER: Send address changes to Circulation, BLOOMBERG MARKETS, P.O. Box 1583, New York, NY 10150-1583. Periodicals postage paid in New York and at additional mailing offices.